

(FILE 'HOME' ENTERED AT 15:06:38 ON 17 JUN 2003)

FILE 'BIOSIS, CABAB, CAPLUS, EMBASE, LIFESCI, MEDLINE, SCISEARCH,
USPATFULL, JAPIO' ENTERED AT 15:06:50 ON 17 JUN 2003

L1 2467 S ENTOMOPATHOGENIC FUNGI
L2 389 S HYPHAL BODY
L3 1893 S CORDYCEPS
L4 30 S L1 AND L2
L5 2 S L4 AND L3
L6 474732 S INOCULAT?
L7 215 S L6 AND L1
L8 3 S L7 AND L2
L9 30652 S SILKWORM
L10 .20 S L1 AND L9
L11 0 S L10 AND L2
L12 445 S L3 AND MILITARIS
L13 29 S L12 AND L6
L14 1 S L13 AND L2
L15 18 S L12 AND FRUIT BODY
L16 13 DUP REM L15 (5 DUPLICATES REMOVED)

=>

L16 ANSWER 1 OF 13 USPATFULL

AB This invention provides a separation method by which a compound having an antitumor effect possessed by Tochukaso can be obtained in a pure state. Further, this invention reveals the chemical structure of the compound having such antitumor effect. Still further, the invention aims at providing an antitumor agent comprising said compound.

AN 2002:268746 USPATFULL

TI Substance having steroid-like structure, process for the production thereof and antitumor agents containing the same

IN Pan, Tair-Long, Kaohsiung, TAIWAN, PROVINCE OF CHINA
Goto, Sigeru, Kaohsiung, TAIWAN, PROVINCE OF CHINA
Chen, Chao-Long, Kaohsiung, TAIWAN, PROVINCE OF CHINA

PA Hisamitsu Pharmaceuticals Co., Inc., Tosa, JAPAN (non-U.S. corporation)

PI US 6465447 B1 20021015
WO 9943698 19990902

AI US 2000-623029 20000825 (9)
WO 1999-JP889 19990225
20000825 PCT 371 date

PRAI JP 1998-64543 19980227

DT Utility

FS GRANTED

EXNAM Primary Examiner: Webman, Edward J.; Assistant Examiner: Nguyen, Helen

LREP Fitch, Even, Tabin & Flannery

CLMN Number of Claims: 4

ECL Exemplary Claim: 1

DRWN 10 Drawing Figure(s); 10 Drawing Page(s)

LN.CNT 505

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L16 ANSWER 2 OF 13 CAPLUS COPYRIGHT 2003 ACS

AB The invention provides a method for sepn. of an antitumor agent from Tochukaso, e.g., *Cordyceps sinensis*, *Cordyceps sobolifera*, *Cordyceps militaris*, and *Cordyceps nutans*. Also, the chem. structure and characteristics of the antitumor compd. are clarified. An active compd. was isolated from dried powder of Tochukaso fruit bodies by the treatment including MeOH extn., silica gel column chromatog., TLC, and HPLC, and characterized. The compd., which is a brown oily product, showed antiproliferative effects on Vero and Hela tumor cell lines.

AN 1999:566068 CAPLUS

DN 131:175048

TI Method for separation of antitumor agent having steroid-like structure from vegetative wasp (Tochukaso)

IN Pan, Tair-Long; Goto, Sigeru; Chen, Chao-Long

PA Hisamitsu Pharmaceutical Co., Inc., Japan

SO PCT Int. Appl., 28 pp.

CODEN: PIXXD2

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 9943698	A1	19990902	WO 1999-JP889	19990225
	W: AU, CA, CN, US				
	RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
	JP 11315094	A2	19991116	JP 1999-43072	19990222
	CA 2321528	AA	19990902	CA 1999-2321528	19990225
	AU 9925495	A1	19990915	AU 1999-25495	19990225
	AU 753709	B2	20021024		
	EP 1057832	A1	20001206	EP 1999-905313	19990225
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI				
	US 6465447	B1	20021015	US 2000-623029	20000825

PRAI JP 1998-64543 A 19980227
WO 1999-JP889 W 19990225

OS MARPAT 131:175048

RE.CNT 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L16 ANSWER 3 OF 13 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.
AB Seventy two isolates of *Cordyceps militaris* collected from 11 sites in Korea, including two isolates from ATCC, were used to assess genetic variation within *Cordyceps militaris*. The anamorph stage and cultural characteristics of *C. militaris* were observed through microscope and investigated on PDA respectively. The anamorphs of *C. militaris* were identified to be *Verticillium*. Isolates of *C. militaris* showed different growth rates, morphology and color. Fifty six isolates of single ascospore and seventy two isolates of mass ascospore from *C. militaris* were analysed using by Random Amplified Polymorphic DNA (RAPD) for genetic relationship analysis. Fifty six single ascospore isolates fell into two groups by phenogram constructed from distance values using the UPGMA method in NTSYS-pc software: group A from artificial fruit body of *C18* except for isolate 51; group B from artificial fruit body of *C738*. The average genetic distance value within group A is 0.150 and group B is 0.163. The average genetic distance value between the two groups is 0.221. The average genetic distance value within 56 single ascospores is 0.207 and 72 mass ascospores is 0.330. Genetic relationships were not found among 72 mass ascospore isolates obtained from eleven geographically distant populations.

AN 2000:88364 BIOSIS

DN PREV200000088364

TI Analysis of genetic relationship of *Cordyceps militaris* in Korea by Random Amplified Polymorphic DNA.

AU Sung, Jae Mo (1); Kim, Sang Hee; Yoon, Chul Sik; Sung, Gi Ho; Kim, Yong Wook

CS (1) Department of Agricultural Biology, Kangwon National University, Chuncheon, 200-701 South Korea

SO Korean Journal of Mycology, (Aug., 1999) Vol. 27, No. 4, pp. 256-273.
ISSN: 0253-651X.

DT Article

LA Korean

SL English

L16 ANSWER 4 OF 13 CAPLUS COPYRIGHT 2003 ACS

AB A review with 18 refs. *Cordiceps* (Fr.) Link species (Tochukaso in Japanese, caterpillar fungi in Chinese) are a parasite on cicada larvae that forms its sclerotium in the insect larvae. At present, the fruiting bodies of *Cordyceps* species are not cultivated or cultured. However, cultivation of mycelia of this species i.e., *C. sinensis* (Berk.) Sacc., *C. sobolefera* (Hill.) Berk. et Br., *C. militaris* (L.: Fr.) Link, and *Isaria japonica* Lloyd, etc., becomes relatively easy. Antitumor polysaccharides, galactomannan CI-P and CI-A, were isolated from *C. cicadae* Shing (Chinese Semitake) parasitic fungus on the larva of *Cicadae* flammata Dist. On the other hand, a remarkable antitumor active .beta.-_(1.fwdarw.3)-D-glucan CO-1 and galactosaminoglycan CO-N were isolated from *C. ophioglossoides* (Ehrh.) Fr. Hanayashuritake. Antitumor polysaccharides such as galactomannan and .beta.-_(1.fwdarw.3)-D-glucan were isolated from the insect part and fruit body of *C. cicadae*. These polysaccharides were shown to have hypoglycemic activity. D-Mannitol, which is a sugar alc. contained in many plants including fungi and marine algae, was isolated from *Cordyceps* species. It is said that sugar alc. and trehalose help to moisten cells and exert cosmetic effects. The cultured hypha ext. of *Cordyceps* species was orally administered and found to produce antifatigue and motor function improving effects.

AN 2000:460254 CAPLUS

DN 133:290527
TI Medicinal effects and utilization of *Cordyceps* (Fr.) Link
(Ascomycetes) and *Isaria* Fr. (mitosporic fungi) Chinese caterpillar fungi,
"Tochukaso" (review)
AU Mizuno, Takashi
CS Department of Applied Biological Chemistry, Faculty of Agriculture,
Shizuoka University, Fujieda, 426-0063, Japan
SO International Journal of Medicinal Mushrooms (1999), 1(3), 251-261
CODEN: IMMUFR; ISSN: 1521-9437
PB Begell House, Inc.
DT Journal; General Review
LA English
RE.CNT 19 THERE ARE 19 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L16 ANSWER 5 OF 13 USPATFULL
AB An immune-enhancing food comprising a **fruit body**
(sexual generation and nonsexual generation), a mycelium and a
metabolite fluid of an *Isaria*-type insect-raised fungus (
Cordyceps Japonensis) as a main ingredient of the food.
AN 97:14417 USPATFULL
TI Immune-enhancing food comprising *isaria* type insect raised fungus (
cordyceps *japonensis*) as a main ingredient
IN Kondoh, Yoshikazu, Miyagi, Japan
Yahagi, Nobuo, Yamagata, Japan
PA Kondoh et al., Kyoto, Japan (non-U.S. corporation)
PI US 5603937 19970218
AI US 1995-390960 19950221 (8)
PRAI JP 1994-25280 19940223
DT Utility
FS Granted
EXNAM Primary Examiner: Rollins, John W.
LREP Seed and Berry LLP
CLMN Number of Claims: 7
ECL Exemplary Claim: 1
DRWN 3 Drawing Figure(s); 2 Drawing Page(s)
LN.CNT 760

L16 ANSWER 6 OF 13 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.DUPLICATE
1
AB The entomopathogenic fungus, *Cordyceps militaris*, is
considered to be an important factor in suppressing population explosions
of the beech caterpillar, *Quadricalcarifera punctatella*. The number of
fruit bodies produced by the fungus was counted in a
natural beech forest and parasitism was evaluated by burying lab-reared
pupae of the insect in the soil. Seasonal changes in infection rate in the
ground and the corresponding number of **fruit bodies**
were compared. The emergence curve of **fruit body**
production exhibited an L-shape with a peak in late July. The
fruit body of *C. militaris* lasts for about two
weeks and appears from late July to early September. The rate of infection
was found to change seasonally: it was highest in early August when the
number of **fruit bodies** was at a peak, then decreased
gradually until the following summer. From an epizootiological viewpoint,
the results suggested that the **fruit body** plays a role
in enhancing the infection rate of the fungus.
AN 1997:271981 BIOSIS
DN PREV199799563699
TI Seasonal changes in the infection of pupae of the beech caterpillar,
Quadricalcarifera punctatella (Motsch.) (Lep., Notodontidae), by
Cordyceps militaris link (Clavicipitales,
Clavicipitaceae) in the soil of the Japanese beech forest.
AU Kamata, Naoto (1); Sato, H.; Shimazu, M.
CS (1) Tohoku Res. Cent., Forestry Forest Products Res. Inst., Nabeyashiki

SO 72, Shimo Kuiyagawa, Morioka, Iwate 020-01 Japan
Journal of Applied Entomology, (1997) Vol. 121, No. 1, pp. 17-21.
ISSN: 0931-2048.

DT Article
LA English

L16 ANSWER 7 OF 13 JAPIO COPYRIGHT 2003 JPO

AB PURPOSE: To mass-produce a **fruit body** of *Cordyceps sinensis* Sacc. having uniform form at a low cost by grinding mycelium produced by artificial culture, inoculating the mycelium into a culturing substrate consisting of chrysalis after several days from pupation and growing the mycelium into a **fruit body**.
CONSTITUTION: *Cordyceps sinensis* Sacc. (e.g. *Cordyceps militaris*) is artificially cultured by a method inoculating a sterilized culturing substrate of chrysalis system with original fungi of *Cordyceps sinensis* Sacc. and culturing the fungi under dark conditions to produce a mycelium. Then, the mycelium is subjected to pulverizing treatment, preferably together with the culturing substrate and inoculated into a culturing substrate consisting of chrysalis after several days from pupation (preferably silkworm chrysalis) to grow the mycelium into a **fruit body**. The pulverized mycelium is grown into the **fruit body** by culturing the mycelium under dark conditions of 10°C for 30 days to form the mycelium over whole the culturing substrate, carrying out culture at 20°C and 400-600 lux until all mycelia exhibit red color and embedding the mycelium into vermiculite-like soil together with fresh chrysalis which is the culturing substrate and culturing the mycelium.

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AN 1996-172903 JAPIO

TI METHOD FOR CARRYING OUT LARGE-SCALE CULTURE OF CORDYCEPS SINENSIS CASS. AND LARGE-SCALE CULTURING SUBSTRATE

IN MATSUNO ETSUKO

PA MATSUNO BIO RES:KK

PI JP 08172903 A 19960709 Heisei

AI JP 1994-340821 (JP06340821 Heisei) 19941223

PRAI JP 1994-340821 19941223

SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1996

L16 ANSWER 8 OF 13 JAPIO COPYRIGHT 2003 JPO

AB PURPOSE: To carry out the large-scale artificial culture of **fruit body** of *Cordyceps sinensis* Sacc. which is equivalent to natural **fruit body** by culturing *Cordyceps sinensis* Sacc. in sterilized dried chrysalis to form a mycelium, culturing the mycelium in soil and germinating **fruit body** thereof on the soil surface.

CONSTITUTION: This method for culturing *Cordyceps militaris* comprises using dried chrysalis (preferably dried silkworm chrysalis) as a culturing substrate, sterilizing the culturing substrate by a method for adding city water in an amount of 100ml based on 100g culturing substrate to the culturing substrate, passing steam through the substrate at 120°C for 20min, then inoculating the sterilized culturing substrate with *Cordyceps sinensis* Sacc. (preferably *Cordyceps militaris*) and culturing *Cordyceps sinensis* Sacc. to form a mycelium, successively embedding the mycelium into soil, preferably vermiculite-like soil, culturing the mycelium so that the **fruit body** germinates on the soil surface. Furthermore, culture of *Cordyceps sinensis* Sacc. in culturing substrate is at first carried out under dark conditions at 20°C for 30 days and then, after the mycelium is formed over whole culture substrate, the culture is preferably carried out at 400-600 lux for 30-50 days until the mycelium exhibits red color tone.

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AN 1996-172902 JAPIO

TI METHOD FOR CULTURING CORDYCEPS MILITARIS

IN MATSUNO ETSUKO
PA MATSUNO BIO RES:KK
PI JP 08172902 A 19960709 Heisei
AI JP 1994-340820 (JP06340820 Heisei) 19941223
PRAI JP 1994-340820 19941223
SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1996

L16 ANSWER 9 OF 13 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.
AB A *Cordyceps* species arising from larvae of Lepidoptera was collected on 16 September 1994 in a plantation of Japanese larch at Ajigasawa town, Nishitsugaru-gun, Aomori prefecture. Based on the morphological features, this fungus was identified as *C. militaris*. Using this *Cordyceps* material and artificially grown pupae of *Mamestra brassicae* Linne, inoculation experiments to produce *Cordyceps* fruit body in the laboratory were performed as follows: ascospore suspension was prepared from the stroma of the fungus and the living pupae were immersed for a few minutes in this suspension. The pupae thus inoculated were placed on wet Sphagnum moss in deep Petri dishes and kept under diffuse sunlight in the laboratory (room temperature: 15-20 degree C). Forty days after inoculation, fruit body initials began to appear from the pupae, which continued to grow and finally were found to contain perithecia with mature asci and ascospores. Similar inoculation experiments were repeated three more times at room temperature or in a growth chamber with controlled temperature and light conditions (7.5-25 degree C). In each experiment, mature fruit bodies were formed on the inoculated pupae at high rates (13.8-76.0%).

AN 1995:491051 BIOSIS

DN PREV199598505351

TI Production of *Cordyceps militaris* fruit body on artificially inoculated pupae of *Mamestra brassicae* in the laboratory.

AU Harada, Yukio; Akiyama, Naoji; Yamamoto, Kenji; Shirota, Yasuyuki

CS Fac. Agric., Hirosaki Univ., 3 Bunkyo-cho, Hirosaki, Aomori 036 Japan

SO Nippon Kingakukai Kaiho, (1995) Vol. 36, No. 2, pp. 67-72.

ISSN: 0029-0289.

DT Article

LA Japanese

SL Japanese; English

L16 ANSWER 10 OF 13 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.

AB The genus *Cordyceps* known as an insect parasite forms a sclerotium in insect bodies and then produces perithecia on the single or multiple stromata produced from sclerotium. Collected *Cordyceps* were identified into 5 species: *Cordyceps militaris*, *C. nutans*, *Cordyceps sphecocephala*, *Isaria japonica*, and *Torrubbiella* sp. The fruit bodies of *Cordyceps* in petri-dish cover were fixed by tape and put the lid on water agar plates to isolate these collected *Cordyceps*. The germinated spores were transferred from water agar to Potato dextrose agar (PDA) after six hours. Mycelial growth of *C. nutans* and *C. militaris* was the most successful on Hamada media and was also good on Complete media and PDA. Mannose as a carbon source was good for two species and Glutamic acid as a nitrogen source was satisfactory to *C. militaris* and Asparagine gave a good result to *C. nutans*. *C. militaris* and *C. nutans* showed similar mycelial growth rate on the media that contained thiamine-HCl, biotine or nicotinic acid as a vitamin. When conidia of *C. nutans* were inoculated to insects, mortality was high in *Artogeia napi* L., Hemiptera, *Plutella xylostella* and 50% in Orthoptera, 12% in *Acantholyda posticalis* M, but not *Agelastica coerulea* B. in Aphididae, *C. nutans* was collected from only Hemiptera in nature, but killing effect on other insects was proved. Mycelial growth and fruit-body formation were good on the media that consist of rice powder 5 g, wheat flour 5 g, water 100 ml, but formed fruit-body was not

complete stromata but a mass of conidia according to results of observing microscope.

AN 1994:18853 BIOSIS
DN PREV199497031853
TI Studies on distribution and utilization of *Cordyceps militaris* and *C. nutans*.
AU Sung, Jae-Mo (1); Kim, Chun-Hwan; Yang, Kun-Joo; Lee, Hyun-Kyung; Kim, Yang-Sup
CS (1) Dep. Agric. Biol., Kangweon Natl. Univ., Chuncheon South Korea
SO Korean Journal of Mycology, (1993) Vol. 21, No. 2, pp. 94-105.
ISSN: 0253-651X.
DT Article
LA Korean
SL Korean; English

L16 ANSWER 11 OF 13 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.DUPLICATE
2

AB Tochukaso is a Chinese traditional medicine composed of a fruit body of *Cordyceps sinensis* and its parasitic host larva. Tochukaso (*C. sinensis*) and the cultured mycelia of five species of *Cordyceps* and four species of *Isaria* were each extracted with hot water and examined for the inotropic effect on guinea-pig right atrium in vitro system. The extracts from *C. militaris* and *I. felina* showed a negative inotropic effect to approximately the same extent as that from Tochukaso. These three extracts also showed inhibitory action on twitch response of guinea-pig ileum and aggregation of human blood platelet. It is suggested that these activities are ascribed to the combination of adenosine, 5'-adenosine monophosphate and several other nucleic acid-related compounds, all of which have been shown to be present in the extracts.

AN 1992:31240 BIOSIS
DN BA93:20515
TI PHYSIOLOGICALLY ACTIVE COMPOUNDS IN THE EXTRACTS FROM TOCHUKASO AND CULTURED MYCELIA OF CORDYCEPS AND ISARIA.
AU IKUMOTO T; SASAKI S; NAMBA H; TOYAMA R; MORITOKI H; MOURI T
CS RES. LAB., TAITO CO. LTD., 1-26 HIGASHISHIRIIKESHIMACHI, NAGATA-KU, KOBE, 653, JAPAN.
SO YAKUGAKU ZASSHI, (1991) 111 (9), 504-509.
CODEN: YKKZAJ. ISSN: 0372-7750.
FS BA; OLD
LA Japanese

L16 ANSWER 12 OF 13 SCISEARCH COPYRIGHT 2003 THOMSON ISI

AB Tochukaso is a Chinese traditional medicine composed of a fruit body of *Cordyceps sinensis* and its parasitic host larva. Tochukaso (*C. sinensis*) and the cultured mycelia of five species of *Cordyceps* and four species of *Isaria* were each extracted with hot water and examined for the inotropic effect on guinea-pig right atrium in vitro system. The extracts from *C. militaris* and *I. felina* showed a negative inotropic effect to approximately the same extent as that from Tochukaso. These three extracts also showed inhibitory action on twitch response of guinea-pig ileum and aggregation of human blood platelet. It is suggested that these activities are ascribed to the combination of adenosine, 5'-adenosine monophosphate and several other nucleic acid-related compounds, all of which have been shown to be present in the extracts.

AN 91:579077 SCISEARCH
GA The Genuine Article (R) Number: GJ983
TI PHYSIOLOGICALLY ACTIVE COMPOUNDS IN THE EXTRACTS FROM TOCHUKASO AND CULTURED MYCELIA OF CORDYCEPS AND ISARIA
AU IKUMOTO T (Reprint); SASAKI S; NAMBA H; TOYAMA R; MORITOKI H; MOURI T
CS TAITO CO LTD, RES LAB, 1-26 HIGASHISHIRIIKESHINMACHI, NAGATA KU, KOBE 653, JAPAN (Reprint); UNIV TOKUSHIMA, FAC PHARMACEUT SCI, TOKUSHIMA 770, JAPAN; TOYO JR COLL FOOD TECHNOL, MINAMIHANAYASHIKI, KAWANISHI 666, JAPAN

CYA JAPAN
SO YAKUGAKU ZASSHI-JOURNAL OF THE PHARMACEUTICAL SOCIETY OF JAPAN, (1991)
Vol. 111, No. 9, pp. 504-509.
DT Article; Journal
FS LIFE
LA Japanese
REC Reference Count: 10
ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

L16 ANSWER 13 OF 13 LIFESCI COPYRIGHT 2003 CSA
AB The paper includes a list of localities of *Cordyceps militaris* (Vaill. ex L.) Link in Poland. A description of the fruit bodies based on Polish material is given. The taxonomic position, ecology, and geographical distribution are discussed.
AN 81:70936 LIFESCI
TI *Cordyceps militaris* (Vaill. ex L.) Link
(Ascomycotina) in Poland.
 Cordyceps militaris (Vaill. ex L.) Link
(Ascomycotina) w Polsce
AU Komorowska, H.
CS Mycol. Lab., Inst. Bot., Polish Acad. Sciences, Lubicz 46, 31-512 Krakow,
Poland
SO FRAG. FLOR. GEOBOT., (1981) vol. 27, no. 4, pp. 657-666. Published in
1983..
DT Journal
FS D; K
LA Polish
SL English

=>

L4 ANSWER 8 OF 10 SCISEARCH COPYRIGHT 2003 THOMSON ISI
AB *Cordyceps sphecocephala* and a *Hymenostilbe* sp. were recorded from Hymenoptera (wasps and bees) in natural forest in Thailand. These were isolated from **hyphal bodies, ascus part-spores** and from conidia. The possible relationship between the two fungi is discussed. These records are compared with other collections from around the world.
AN 95:192911 SCISEARCH
GA The Genuine Article (R) Number: QL457
TI CORDYCEPS SPHECOCEPHALA AND A HYMENOSTILBE SP. INFECTING WASPS AND BEES IN THAILAND
AU HYWELJONES N (Reprint)
CS KASETSART UNIV, NATL BIOL CONTROL RES CTR, POB 9-52, BANGKOK 10900, THAILAND (Reprint); MINIST SCI, NATL SCI & TECHNOL DEV AGCY, NATL CTR GENET ENGN & BIOTECHNOL, BANGKOK 10400, THAILAND
CYA THAILAND
SO MYCOLOGICAL RESEARCH, (FEB 1995) Vol. 99, Part 2, pp. 154-158.
ISSN: 0953-7562.
DT Article; Journal
FS AGRI
LA ENGLISH
REC Reference Count: 15
*ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

L9 ANSWER 1 OF 64 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.DUPLICATE
1

AB Pure cultures of Tuber maculatum, Tuber melanosporum, Tuber aestivum, Tuber macrosporum, Tuber rufum and Tuber brumale were isolated and characterized by morphological and molecular methods, The Tuber mycelia were isolated from fruit bodies and molecular identification was performed using specific primers, restriction fragment length polymorphism and/or sequence analyses of the ITS region, The species grew between 1.1 mm wk⁻¹ and 14 mm wk⁻¹ on the selected medium. The mycelium of different Tuber species showed several common morphological features such as hyphal anastomoses, vesicle formation and hyphal aggregation. Differences were found in the frequency of these morphological features and in the hyphal pattern. The isolated mycelia also showed differences in the hyphal branch angle, septal distance, hyphal diameter and rate of growth of the hyphae, This result opens the possibility of using pure mycelial cultures of Tuber spp. for experimental purposes and for the commercial production of infected truffle plants.

AN 2002:549205 BIOSIS

DN PREV200200549205

TI Morphological and molecular characterization of mycelia of some Tuber species in pure culture.

AU Iotti, M.; Amicucci, A.; Stocchi, V.; Zambonelli, A. (1)

CS (1) Dipartimento di Protezione e Valorizzazione Agroalimentare, University of Bologna, Bologna: zambonel@agrsci.unibo.it Italy

SO New Phytologist, (September, 2002) Vol. 155, No. 3, pp. 499-505.
<http://www.blackwell-science.com/nph>. print.
ISSN: 0028-646X.

DT Article

LA English

L9 ANSWER 2 OF 64 SCISEARCH COPYRIGHT 2003 THOMSON ISI

AB Arbuscular mycorrhizal (AM) fungi produce an extensive hyphal network which develops in the soil, producing a specialised niche for bacteria. The aim of this paper is to review briefly the interactions shown by these symbiotic fungi with two bacterial groups: (i) the plant-growth promoting rhizobacteria (PGPRs) which are usually associated with fungal surfaces in the rhizosphere, and (ii) a group of endocellular bacteria, previously identified as being related to Burkholderia on the basis of their ribosomal sequence strains. The endobacteria have been found in the cytoplasm of some isolates of AM fungi belonging to Gigasporaceae and offer a rare example of bacteria living in symbiosis with fungi.

AN 2002:825373 SCISEARCH

GA The Genuine Article (R) Number: 600KY

TI Arbuscular mycorrhizal fungi: a specialised niche for rhizospheric and endocellular bacteria

AU Bianciotto V; Bonfante P (Reprint)

CS CNR, Dipartimento Biol Vegetale, Viale Mattioli 25, I-10125 Turin, Italy (Reprint); CNR, Dipartimento Biol Vegetale, I-10125 Turin, Italy; CNR, Ctr Studio Micol Terreno, I-10125 Turin, Italy

CY A Italy

SO ANTONIE VAN LEEUWENHOEK INTERNATIONAL JOURNAL OF GENERAL AND MOLECULAR MICROBIOLOGY, (SEP 2002) Vol. 81, No. 1-4, pp. 365-371.
Publisher: KLUWER ACADEMIC PUBL, VAN GODEWIJCKSTRAAT 30, 3311 GZ DORDRECHT, NETHERLANDS.
ISSN: 0003-6072.

DT Article; Journal

LA English

REC Reference Count: 42
ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

L9 ANSWER 3 OF 64 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.DUPLICATE
2

AB Ascomycetes obligately growing on gametophytes of mosses and hepatics normally do not form ascomata at non-specific sites on their hosts, but rather occupy distinct and species-specific microsites, e.g. leaf nerves or hyaline hair points in mosses, subterranean rhizoids or antheridial cups in Polytrichaceae, and perianths, leaf borders or axils, or even individual leaf cells in foliose hepatics. Niche selection is a typical, often diagnostic, feature of bryophilous ascomycetes. Knowing the sites of fruit-body formation facilitates the discovery of these frequent but inconspicuous fungi. All microhabitats so far discovered are identified and separately recorded with representative occupants for thallose hepatics (three niches), foliose hepatics (ten), Polytrichales (eight), and other mosses (eight). For most of these cases niche occupation is illustrated. Microsites are often characterized by two independent features important for a successful bryophilous manner of life, namely, a degree of protection against rapid loss of water and a degree of exposure allowing unhindered spore dispersal by air currents. The relatively small group consisting of *Polytrichum* and related genera have a high number of niches reflecting the extraordinary structural complexity of these large and perennial mosses. Especially within the narrow spaces between the longitudinal photosynthetic leaf lamellae, fruit-bodies are regularly present, offering striking examples of convergent evolution. The interlamellar spaces represent the best-documented habitat for ascomycetes in bryophytes. Thallose hepatics have much fewer microsites than the species-rich foliose hepatics, which are always differentiated into stems and leaves. Ascomata immersed in the spongy thalli are typical for marsh-antialean hosts. The morphologically simple jungermannialean leaves, consisting of a unistratose layer of cells, offer a mosaic-like pattern of microsites that are selected among for fruit-body formation by distinct species. One of the most typical strategies is leaf perforation. The same niche on a host plant may be used by two or several systematically divergent fungi, but the same species is normally not present in different niches. Apparently, perithecia or perithecioid-like ascomata are more suitable for adaptation to these niches than are apothecia. Relationships between microniche occupation and factors such as **hyphal** growth within or outside the substrate, ascoma morphology and effective spore dispersal are discussed taking host conditions into consideration.

AN 2003:176583 BIOSIS

DN PREV200300176583

TI Microniches occupied by bryophilous ascomycetes.

AU Doeppeler, Peter (1)

CS (1) Fakultaet fuer Biologie, Department Biologie I, Bereich Biodiversitaetsforschung: Systematische Botanik, Menzinger Strasse 67, D-80638, Muenchen, Germany: doepp@botanik.biologie.uni-muenchen.de Germany

SO Nova Hedwigia, (November 2002, 2002) Vol. 75, No. 3-4, pp. 275-306. print.
ISSN: 0029-5035.

DT Article

LA English

L9 ANSWER 4 OF 64 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.DUPLICATE
3

AB B incompatibility factor mutants (*Bmut*) in *Pleurotus ostreatus* were recovered from common-B mating heterokaryons resulted from matings between wild-type monokaryons with different A but the same B factors (A1B2 and A2B2) after NTG mutagenesis. The mutant monokaryons such as A1B2mut and A2B2mut were observed to have regularly uninucleated **hyphal** cells and to be compatible with each other. Matings between A1B2mut and A2B2mut monokaryons produced stable heterokaryons (A1B2mut+A2B2mut) that had binucleated **hyphal** cells with true clamp connections and formed normal **fruit-bodies**. Mating tests using basidiospore progeny from each of these heterokaryons revealed the bipolar mating pattern. Genetic analysis suggested that the mutation of B factor in *P. ostreatus* might occur in the B incompatibility factor genes.

AN 2003:12397 BIOSIS

DN PREV200300012397
TI Isolation of the B incompatibility factor mutants in *Pleurotus ostreatus*.
AU Obatake, Yasushi (1); Murakami, Shigeyuki; Hasebe, Kozaburou;
Fukumasa-Nakai, Yukitaka
CS (1) Nara Forest Research Institute, Kibi 1, Takatori, Nara, 635-0133,
Japan: obatakey@nararinshi.pref.nara.jp Japan
SO Mycoscience, (June 2002, 2002) Vol. 43, No. 3, pp. 197-200. print.
ISSN: 1340-3540.
DT Article
LA English

L9 ANSWER 5 OF 64 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.
AB The chemical structure of the cell wall of two isolates of *Verticillium fungicola* collected from diseased fruit bodies of the commercial mushroom *Agaricus bisporus* treated with the fungicide Prochloraz-Mn was analyzed. The isolates were obtained during different periods of time and grown in the absence and presence of the LD₅₀ values of the fungicide for *V. fungicola*. In addition, another *V. fungicola* isolate collected previous to the routine utilization of Prochloraz-Mn but grown under the same conditions was also analyzed. The overall chemical composition of the cell wall from the three isolates showed detectable differences in their basic components, with a significant decrease in the protein content in fungicide-treated cells. This inhibitory effect was partially compensated by an increase in neutral and/or aminated carbohydrates and was accompanied by appreciable modifications of polysaccharide structure, as deduced after methylation analysis and gas-liquid chromatography-mass spectrometry (GLC-MS). Moreover, differences in hyphal morphology caused by the fungicide were observed by transmission electron microscopy (TEM).

AN 2002:584625 BIOSIS
DN PREV200200584625
TI Effect of the fungicide Prochloraz-Mn on the cell wall structure of *Verticillium fungicola*.
AU Bernardo, D.; Novaes-Ledieu, M.; Perez Cabo, A.; Gea Alegria, F. J.; Garcia Mendoza, C. (1)
CS (1) Centro de Investigaciones Biologicas, CSIC, Velazquez 144, 28006, Madrid: cgm@cib.csic.es Spain
SO International Microbiology, (September, 2002) Vol. 5, No. 3, pp. 121-125. print.
ISSN: 1139-6709.
DT Article
LA English

L9 ANSWER 6 OF 64 CABO COPYRIGHT 2003 CABI
AB Field ectomycorrhizas of *N. escharioides* on *A. acuminata* are described in detail for the first time. Naturally occurring ectomycorrhizal roots were sampled beneath sporocarps of *N. escharioides*. The samples were taken from four natural forest plots at two homogeneous *A. acuminata* sites (Tucuman and Catamarca Provinces, Argentina). The ectomycorrhizas were characterized morphologically and compared by means of PCR/RFLP analysis of the internal transcribed spacer region of the nuclear rDNA. The most important morphological features of the ectomycorrhizas are a white to pale yellow mantle, simple to monopodial branches, hyaline emanating hyphae, abundant hyphal bundles emerging more or less perpendicularly from a plectenchymatous mantle, and an acute or rounded apex with or without a mantle. *N. escharioides* fruit bodies have white basal mycelium with emanating hyphae similar to those of andean alder ectomycorrhizas. The RFLP profiles of sporocarps and mycorrhizas were the same.

AN 2002:129436 CABO
DN 20023071330
TI Ectomycorrhizae between *Alnus acuminata* H.B.K. and *Naucoria escharioides* (Fr.:Fr.) Kummer from Argentina
AU Becerra, A.; Daniele, G.; Dominguez, L.; Nouhra, E.; Horton, T.

CS Instituto Multidisciplinario de Biología Vegetal (CONICET), C.C. 495, 5000.
Cordoba, Argentina.

SO Mycorrhiza, (2002) Vol. 12, No. 2, pp. 61-66. 40 ref.
ISSN: 0940-6360

DT Journal

LA English

L9 ANSWER 7 OF 64 USPATFULL

AB A strain of chanterelle (*C. cibarius* Fr.Fr.) designated SNGT2-A is described herein. SNGT2-A can be grown in axenic culture as vegetative mycelia. SNGT2-A has a DNA fingerprint that distinguishes it from all other *C. cibarius* strains tested.

AN 2001:6695 USPATFULL

TI Chanterelle mycelium

IN Danell, Eric, Uppsala, Sweden

PA Cantharellus AB, Stockholm, Sweden (non-U.S. corporation)

PI US 6173525 B1 20010116

AI US 1997-933555 19970919 (8)

DT Utility

FS Granted

EXNAM Primary Examiner: Lankford, Jr., Leon B.

LREP Fish & Richardson, P.C., P.A.

CLMN Number of Claims: 9

ECL Exemplary Claim: 1

DRWN 1 Drawing Figure(s); 1 Drawing Page(s)

LN.CNT 505

L9 ANSWER 8 OF 64 LIFESCI COPYRIGHT 2003 CSA

AB The heterobasidiomycete moss parasites *Eocronartium* and *Jola* have figured prominently in theories of the evolution of the rust fungi and of the basidiomycetes. Such theories made implicit assumptions about the moss parasites, although very little of their life history was known. This is the first in a series of studies to elucidate the life history of the moss parasites. Polyspore monokaryotic cultures were obtained from basidiospores, and dikaryotic cultures were obtained from hyphae inside the moss host plant. In culture, the moss parasites produced Sporothrix-like anamorphs. The uninucleate conidia germinated by a germ tube, by production of single secondary conidia, or by iterative germination. Conidial-hyphal fusion was observed. A dikaryon was produced by mating single conidial isolates of *Eocronartium muscicola*, completing a part of its life history. Ultrastructural characteristics of wall break at branching, condensed chromatin during interphase, and simple septal pore morphology from fruiting bodies of *Jola* spp. and cultured isolates of *Jola javensis* and *E. muscicola* were consistent with those of related auricularioid phytoparasitic taxa, the rust fungi, and *Pachnocybe ferruginea*. *Jola* and *Eocronartium* can be grown in axenic culture and are not obligate parasites. In nature, the Sporothrix-like anamorph of these fungi may function in dispersal and mating. The previously unknown anamorph of the moss parasites may be instrumental in our understanding of the origin and evolution of the rust uredinial stage.

AN 2001:94671 LIFESCI

TI The heterobasidiomycete moss parasites *Jola* and *Eocronartium* in culture: cytology, ultrastructure, and anamorph

AU Frieders, E.M.; McLaughlin, D.J.

CS Department of Biology, University of Wisconsin-Platteville, Platteville, WI 53818, USA; E-mail: frieders@uwplatt.edu

SO Mycological Research [Micol. Res.], (20010600) vol. 105, no. 6, pp. 734-744.
ISSN: 0953-7562.

DT Journal

FS K

LA English

SL English

L9 ANSWER 9 OF 64 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.

AB The ontogeny of the fruit bodies of *Mycena stylobates* was studied by light microscopy and scanning electron microscopy (SEM). The ontogeny was divided into two phases: first the primordium with all the structures of the mature fruit body was established, then the primordial stipe elongated rapidly and the exposed hymenium started producing spores immediately. The first detected stage of fruit body formation was an irregularly arranged **hyphal structure** within the substrate colonized. After the rupture of the surface of the substrate, the primordium established on the surface. Soon a layer of wrapping hyphae was differentiated, which covered the complete primordium. The structures of the stipe and the cap developed synchronously. The developing stipe, cap and basal disc together formed a secondary ring-like cavity, in which the development of the hymenophore took place. The lower side of the cap was covered by a layer of degenerated hyphae. The development of the hymenophore started with a number of small alveolae on the lower side of the cap, which were covered with a hymenophoral palisade. The margins of these alveolae formed the primary lamellae, which in the first stage of their development were covered by a layer of degenerated hyphae. The hymenophoral palisade spread from the developing alveolae to the lamellar edge; the edge of the primary lamellae was forked in the early stages. Secondary lamellae were formed by the down folding of ridges from the lower side of the cap. In contrast to the primary lamellae, they were covered with hymenophoral palisade from the beginning. Spore production started immediately after the elongation of the stipe. These results were compared with other known modes of ontogeny within the Agaricales and some comments on the terminology used for the description of basidiome morphogenesis are made.

AN 2001:373471 BIOSIS

DN PREV200100373471

TI The ontogeny of the fruit bodies of *Mycena stylobates*.

AU Walther, Volker; Rexer, Karl-Heinz (1); Kost, Gerhard

CS (1) Fachbereich Biologie, Spezielle Botanik und Mykologie, Philipps-Universitaet Marburg, Karl-von-Frisch-Strasse, D-35032, Marburg: rexer@mail.uni-marburg.de Germany

SO Mycological Research, (June, 2001) Vol. 105, No. 6, pp. 723-733. print.
ISSN: 0953-7562.

DT Article

LA English

SL English

L9 ANSWER 10 OF 64 CABO COPYRIGHT 2003 CABI

AB Mycorrhizal associations are almost ubiquitous, and the effects of this symbiosis on plant health, and on the ability of plants to grow productively in suboptimal environments are profound. Ectomycorrhizal fungi are found on most absorbing short roots of tree species in boreal and temperate forests where they affect growth, water and nutrient absorption, and provide protection from root diseases. Ectomycorrhizal fungi mainly belong to the Basidiomycetes, although many species are found within the Ascomycetes (truffles). The switch between saprophytic and mycorrhizal lifestyles probably happened convergently, and perhaps many times, during evolution of these fungal lineages. The ectomycorrhizas are characterized by the presence of 3 structural components: a sheath or mantle of fungal tissue which encloses the root; a labyrinthine inward growth of hyphae between the epidermal and cortical cells; and an outwardly growing system of **hyphal elements** which form essential connections with both the soil and the **fruit bodies** of the fungi forming the ectomycorrhizas. The extramatrical hyphae, the ectomycorrhizal mantle and the intra-radicular **hyphal network** are active metabolic entities that provide essential nutrient resources to the host plant. These nutrient contributions are reciprocated by the provision of a stable carbohydrate-rich niche in the roots for the fungal partner, making the

relationship a mutualistic symbiosis. Data are presented on the analysis of the persistence and dissemination of populations of introduced ectomycorrhizal Basidiomycetes, and the detection of gene flows between introduced strains and local forest populations.

AN 2002:76230 CABA
DN 20023008816
TI The ectomycorrhizal symbiosis: a sustainable interaction between trees and fungi
La symbiose ectomycorhizienne: une interaction durable entre arbres et champignons
AU Martin, F.; Selosse, M. A.; Tacon, F. le; le Tacon, F.
CS UMR INRA/UHP, "Interactions Arbres/Micro-organismes", Centre INRA de Nancy, 54280 Champenoux, France.
SO Comptes rendus de l'Academie d'Agriculture de France, (2001) Vol. 87, No. 3, pp. 101-107. 27 ref.
Meeting Info.: Interactions durables entre micro-organismes et leurs hôtes. Séance spécialisée, 25 avril 2001.
ISSN: 0989-6988
DT Journal; Conference Article
LA French
SL English

L9 ANSWER 11 OF 64 CABA COPYRIGHT 2003 CABI
AB Four substrates with cottonseed hulls (CH) and corn straw (CS) at different rates: (1) with 100% CS, (2) with 75% CS and 25% CH, (3) with 50% CS and 50% CH and (4) with 100% CH, were prepared. The *P. ostreatus* strain Jiangdu No. 20 was inoculated on these substrates to investigate the growth of hyphae and fruit bodies (FB). The fastest hyphal growth rate was recorded on substrate (3), and the slowest on substrate (4). The FB growth on substrates (1)-(4) were in accordance with the exponential growth curve. The total FB yield increased with CH content. The FB on the substrates with CS had a later peak time in growth rate than that on the substrates with CH alone, and a longer production stage. The biggest increase in growth rate of FB was obtained on substrate (4), followed by substrate (3). Substrates (1)-(4) had biological efficiencies of 97.5, 105, 137.5 and 161.5% and input-output ratios 2.07, 2.04, 2.46 and 2.48, respectively. Considering growth status, yield, cost, resources, etc., substrate (3) was recommended as the ideal substrate.

AN 2003:32994 CABA
DN 20023016530
TI Effects of cottonseed hull content in corn straw substrate on production of *Pleurotus ostreatus*
AU Qi ZhiGuang; Wang Li'An; Liu ShuGuang; Qi, Z. G.; Wang, L. A.; Liu, S. G.
CS Microbiology Department, Hebei Teachers University, Shijiazhuang, Hebei 050016, China.
SO Edible Fungi of China, (2001) Vol. 20, No. 5, pp. 13-14. 5 ref.
ISSN: 1003-8310
DT Journal
LA Chinese
SL English

L9 ANSWER 12 OF 64 CABA COPYRIGHT 2003 CABI
AB Jinzhengu 19 (a parental strain from Yunnan, China; strain 1) and 4 strains isolated from the tissue culture of 4 parts of fruit bodies (FB), i.e., trama (strain 2), stipe (strain 3), juncture of pileus and stipe (strain 4), and pileus (strain 5), were inoculated onto a medium containing 18% cottonseed hulls, 18% sawdust, 9% wheat bran and 50% water. Variance analysis on the results indicated that differences among the 6 strains were non-significant regarding yield, production cycle (from inoculating time to last harvesting time), and fruit body colour and shape. No difference was recorded in hyphal growth potential between isolated strains and strain 1 except for strain 2. Based on these results, it was inferred that there was significant genetic stability in

culture characteristics between the parental strain and isolated strains, and among the isolated strains from tissues of different parts of fruit body.

AN 2002:158152 CABA
DN 20013153977
TI Study on cultural characteristics of *Flammulina velutipes* strains from tissue culture
AU Zheng YueLing; Gao GuanShi; Sang Lan; Zheng, Y. L.; Gao, G. S.; Sang, L.
CS Edible Fungi Institute, All-China General Supply and Marketing Cooperative in China, Kunming, Yunnan 650223, China.
SO Edible Fungi of China, (2001) Vol. 20, No. 2, pp. 13-14. 3 ref.
DT Journal
LA Chinese
SL English

L9 ANSWER 13 OF 64 CABA COPYRIGHT 2003 CAB
AB The tissues separated from 3 parts, basal stipe (BS), middle stipe (MS), and juncture of pileus and stipe (JHS), of **fruit bodies** (FB) of 3 mushroom species, *Pleurotus sapidus*, *Lentinus edodes* [*Lentinula edodes*] and *Flammulina velutipes*, were inoculated onto 3 media at pH 6.8: (I) containing potato extract 20% (w/w), glucose 2%, MgSO₄ 0.015% and KH₂PO₄ 0.02%, (II) containing potato extract 10%, mushroom stipe extract 10%, sugar 2% and agar 2%, and (III) containing maltose 2%, peptone 1%, yeast juice 1% and agar 2%, to compare their **hyphal** growth. The tissues from JHS of *P. sapidus* FB on the 3 media had a higher **hyphal** growth potential (HGP) or faster **hyphal** growth velocity (HGV) than those from BS or MS. The tissues from BS or MS of *L. edodes* FB on the 3 media had HGP or HGV values higher than those from JHS. The tissues from MS of *F. velutipes* FB on the 3 media had HGV or HGV values higher than those from JHS, whereas the tissues from BS on 3 media didn't grow. The tissues from any part of *P. sapidus*, *L. edodes* or *F. velutipes* on III had HGV or HGP values higher than those on I and II.

AN 2002:138097 CABA
DN 20013153975
TI Study on growth of hyphae from different tissues of **fruit bodies** of three mushroom species
AU Zhang Gong; Hou ZhiLian; Zheng Ting; Zhang, G.; Hou, Z. L.; Zheng, T.
CS Department of Biology, Inner Mongolia University, Hohhot, Inner Mongolia 010022, China.
SO Edible Fungi of China, (2001) Vol. 20, No. 2, pp. 9-10. 4 ref.
DT Journal
LA Chinese
SL English

L9 ANSWER 14 OF 64 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.DUPLICATE 4
AB The ability to synthesize hydrophobins appears to be a unique property of a fungal organism. These proteins appear on 2-3rd day of growth. They are secreted through the **hyphal** apex into the medium. Formation of a amphipathic film on the surface of conidiospores, aerial hyphae and **fruit bodies** is the distinctive property of this cystein-rich proteins containing up to 100+25 amino acid residues but the sequence homology between them appears to be rather small. Some hydrophobins have been shown to be involved in adherence phenomena. Their ecological significance apparently implicates dissemination of spores, pathogenesis and symbiosis. The property of hydrophobins to coat the surface with a very thin layer (about 10 nm) that dramatically changes the nature of this surface promises the use of these proteins in biotechnology.

AN 2001:354412 BIOSIS
DN PREV200100354412
TI Fungal hydrophobins: Structure and function.
AU Belozerskaya, T. A.
SO Mikologiya i Fitopatologiya, (2001) Vol. 35, No. 1, pp. 3-11. print.

ISSN: 0026-3648.
DT General Review
LA Russian
SL English

L9 ANSWER 15 OF 64 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.
AN 2001:300597 BIOSIS
DN PREV200100300597
TI Cultivation substrate determines **hyphal ultrastructure during development of Pleurotus pulmonarius fruit bodies.**
AU Sanchez, C. (1)
CS (1) Laboratory of Biotechnology, Research Centre for Biological Sciences, Universidad Autonoma de Tlaxcala, Tlaxcala, TLAX Mexico
SO Van Griensven, L. J. L. D.. Mushroom Science, (2000) Vol. 15, pp. 109-114. Mushroom Science. print.
Publisher: A. A. Balkema 3000 BR, Rotterdam, Netherlands.
Meeting Info.: Proceedings of the 15th International Congress on the Science and Cultivation of Edible Fungi MAASTRICHT, Netherlands May 15-19, 2000
ISSN: 0077-2364. ISBN: 90-5809-143-0 (set), 90-5809-144-9(vol. 1) (cloth), 90-5809-145-7(vol. 2) (cloth).
DT Book; Conference
LA English
SL English

L9 ANSWER 16 OF 64 SCISEARCH COPYRIGHT 2003 THOMSON ISI
AB Mycorrhizal ascomycetous fungi are obligate ectosymbionts that colonize the roots of gymnosperms and angiosperms. In this paper we describe a straightforward approach in which a combination of morphological and molecular methods was used to survey the presence of potentially endo- and epiphytic bacteria associated with the ascomycetous ectomycorrhizal fungus *Tuber borchii* Vittad. Universal eubacterial primers specific for the 5' and 3' ends of the 16S rRNA gene (16S rDNA) were used for PCR amplification, direct sequencing, and phylogenetic analyses. The 16S rDNA was amplified directly from four pure cultures of *T. borchii* Vittad, mycelium. A nearly full-length sequence of the gene coding for the prokaryotic small-subunit rRNA was obtained from each *T. borchii* mycelium studied. The 16S rDNA sequences were almost identical (98 to 99% similarity), and phylogenetic analysis placed them in a single unique rRNA branch belonging to the Cytophaga-Flexibacter-Bacteroides (CFB) phylogroup which had not been described previously. In situ detection of the CFB bacterium in the **hyphal tissue of the fungus *T. borchii*** was carried out by using 16S rRNA-targeted oligonucleotide probes for the eubacterial domain and the Cytophaga-Flexibacter phylum, as well as a probe specifically designed for the detection of this mycelium-associated bacterium. Fluorescent in situ hybridization showed that all three of the probes used bound to the mycelium tissue. This study provides the first direct visual evidence of a not-yet-cultured CFB bacterium associated with a mycorrhizal fungus of the genus *Tuber*.
AN 2000:832260 SCISEARCH
GA The Genuine Article (R) Number: 369FM
TI Phylogenetic characterization and in situ detection of a Cytophaga-Flexibacter-Bacteroides phylogroup bacterium in *Tuber borchii* Vittad, ectomycorrhizal mycelium
AU Barbieri E; Potenza L; Rossi I; Sisti D; Giomaro G; Rossetti S; Beimfohr C; Stocchi V (Reprint)
CS UNIV URBINO, GIORGIO FORNAINI INST BIOCHEM, VIA SAFFI 2, I-61029 URBINO, ITALY (Reprint); UNIV URBINO, GIORGIO FORNAINI INST BIOCHEM, I-61029 URBINO, ITALY; UNIV URBINO, INST BOT, I-61029 URBINO, ITALY; CNR, WATER RES INST, I-00198 ROME, ITALY; VERMICON AG, D-80992 MUNICH, GERMANY
CYA ITALY; GERMANY
SO APPLIED AND ENVIRONMENTAL MICROBIOLOGY, (NOV 2000) Vol. 66, No. 11, pp. 5035-&. Publisher: AMER SOC MICROBIOLOGY, 1752 N ST NW, WASHINGTON, DC 20036-2904.

ISSN: 0099-2240.
DT Article; Journal
FS LIFE; AGRI
LA English
REC Reference Count: 52
ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

L9 ANSWER 17 OF 64 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.DUPLICATE 5

AB Pseudomonas spp. isolates from *Tuber borchii* ascocarps, known to be able to produce phytoregulatory and biocontrol substances in pure culture, were used to perform studies on their possible physiological role in nature. Antimycotic activity was confirmed against fungal contaminants isolated from the ascocarps, suggesting that populations associated with *Tuber borchii* fruit bodies may play a role in the maintenance of ascocarp health. Fifty-five percent of strains tested were also able to release metabolites which affected *T. borchii* mycelial growth and morphogenesis in culture. On the contrary, growth of the arbuscular mycorrhizal fungus *Glomus mosseae* and the ectomycorrhizal fungus *Laccaria bicolor*, putative competitors of *Tuber* for mycorrhizal infection sites on roots, was not influenced by the presence of any bacterial strain. The possibility that these bacteria, which show antifungal activity and fungal growth modulation activities, might be incorporated in the developing ascocarp by means of their preferential adhesion to *Tuber* mycelium is discussed.

AN 2000:168476 BIOSIS
DN PREV200000168476
TI Adhesion to hyphal matrix and antifungal activity of Pseudomonas strains isolated from *Tuber borchii* ascocarps.
AU Sbrana, C.; Bagnoli, G.; Bedini, S.; Filippi, C.; Giovannetti, M.; Nuti, M. P. (1)
CS (1) Dipartimento di Chimica e Biotecnologie Agrarie, Universita di Pisa, Via del Borghetto 80, 56124, Pisa Italy
SO Canadian Journal of Microbiology., (March, 2000) Vol. 46, No. 3, pp. 259-268.
ISSN: 0008-4166.
DT Article
LA English
SL English; French

L9 ANSWER 18 OF 64 CABO COPYRIGHT 2003 CABI

AB The expression profiles of mRNAs of the *Tuber borchii* chitin synthase (Chs) class II gene (from a previously identified DNA fragment), and the class III and IV genes (both isolated from *T. borchii* mycelia) were analysed in the mycelia and ascomata. All 3 mRNAs were constitutively expressed in the vegetative mycelia, regardless of age, mode of growth and hyphal proliferation capacity. Ribonuclease protection analyses revealed class III and IV, but not class II, mRNAs were differentially accumulated in developing *T. borchii* fruit bodies. Marked changes in the expression levels of the Chs3 and Chs4 mRNAs were observed during ascomata maturation. Chs4 transcripts were predominantly represented in immature ascomata, but were completely gone in RNA samples derived from 80% mature ascomata. Chs3 mRNA that accumulated during early maturation stages had a very pronounced late peak in 80% mature ascomata. Nucleotide sequence data have been submitted to the DDBJ/EMBL/GenBank databases under the accession numbers AJ276228 (Chs3) and AJ276229 (Chs4).

AN 2001:56151 CABO
DN 20013037665
TI Differential expression of chitin synthase III and IV mRNAs in ascomata of *Tuber borchii* Vittad
AU Balestrini, R.; Mainieri, D.; Soragni, E.; Garnero, L.; Rollino, S.; Viotti, A.; Ottonello, S.; Bonfante, P.
CS Centro di Studio sulla Micologia del Terreno, CNR and Dipartimento di Biologia Vegetale, University of Torino, V.le Mattioli 25, 10125 Torino,

- Italy.
SO Fungal Genetics and Biology, (2000) Vol. 31, No. 3, pp. 219-232. 41 ref.
ISSN: 1087-1845
DT Journal
LA English
- L9 ANSWER 19 OF 64 CABA COPYRIGHT 2003 CABI
AB We present here some aspects of the morphogenesis and the developmental stages of *A. bisporus* in health and disease. The fruit bodies can react to tissue injuries and to an altered gravitational field. Lamellar morphogenesis can be modified; dysplastic growth patterns can be induced experimentally. It is shown that the hymenophoral type of rosecomb disease is a developmental error ensuing after injury or focal absence of the partial veil. Such a process involves a 'signal-effect couple' which phenomenon helps us to explain morphogenesis in normal and pathological conditions. Defining 'normal' is a difficult task; mycelial cord formation is a normal process for *A. bisporus* but such structures are absent in *Pleurotus* spp. Experimental heavy metal (Zn) intoxication results in developmental errors of the partial veil followed by a process similar to Open Veil Disease. The Hyphal Reserve Cells (HRC) are normally scattered in hyphae as segments remaining in an undifferentiated state throughout the life span of macrofungi. Specific adaptive activities, some of the cellular defense mechanisms, and several pathological conditions can be explained by the hypothesis that describes the HRC as the fungal equivalent of stem cells.
- AN 2000:133480 CABA
DN 200001007811
TI Gross- and microscopic anatomy of *Agaricus bisporus* in health and disease
AU Umar, M. H.; Griensven, L. J. L. D. van; van Griensven, L. J. L. D.;
Griensven, L. J. L. D. van (Editor) [EDITOR]
CS Mushroom Experimental Station, Horst, Netherlands.
SO Science and cultivation of edible fungi. Proceedings of the 15th International Congress on the Science and Cultivation of Edible Fungi, Maastricht, Netherlands, 15-19 May, 2000, (2000) pp. 121-127. 8 ref.
Publisher: A.A. Balkema. Rotterdam
Meeting Info.: Science and cultivation of edible fungi. Proceedings of the 15th International Congress on the Science and Cultivation of Edible Fungi, Maastricht, Netherlands, 15-19 May, 2000.
ISBN: 90-5809-144-9
CY Netherlands Antilles
DT Conference Article; Book; Book Article
LA English
- L9 ANSWER 20 OF 64 CABA COPYRIGHT 2003 CABI
AB Comparison of fruiting bodies of *P. pulmonarius* grown on both synthetic and natural substrates revealed differences in the pattern of differentiation of **hyphal** compartments. Hyphae of fruiting bodies formed on potato extract agar (PEA) had less stainable cytoplasmic material and many more vacuoles than hyphae of fruiting bodies formed on wheat straw. Despite the ultrastructural differences the **hyphal** compartments were of similar length, and those formed on PEA were 13% greater diameter, although fruiting bodies formed on agar media were only about 5% of normal size. This suggests that the control mechanisms which ensure that the normal shape is achieved despite fewer cells depends more on the amount of cytoplasm in the compartment than on the physical volume of the compartment. If the causative factor that determines ultrastructure can be established, there may be scope for manipulating the organoleptic nature of the crop by manipulating composition of the substrate used for its production.
- AN 2000:116098 CABA
DN 20000312827
TI Cultivation substrate determines **hyphal** ultrastructure during development of *Pleurotus pulmonarius* fruit bodies
AU Sanchez, C.; Griensven, L. J. L. D. van [EDITOR]

CS Laboratory of Biotechnology, Research Centre for Biological Sciences,
Universidad Autonoma de Tlaxcala, Mexico.

SO Science and cultivation of edible fungi. Proceedings of the 15th
International Congress on the Science and Cultivation of Edible Fungi,
Maastricht, Netherlands, 15-19 May, 2000, (2000) pp. 109-114. 4 ref.
Publisher: A.A. Balkema. Rotterdam

Meeting Info.: Science and cultivation of edible fungi. Proceedings of the
15th International Congress on the Science and Cultivation of Edible
Fungi, Maastricht, Netherlands, 15-19 May, 2000.
ISBN: 90-5809-144-9

CY Netherlands Antilles

DT Conference Article; Book; Book Article

LA English

L9 ANSWER 21 OF 64 CABO COPYRIGHT 2003 CABI

AB Two fresh specimens of *Xanthochrous rheades* were collected from Fukang,
Xinjiang and Daxing, Beijing, China for pure culture isolation, fruit body
culture, deep fermentation, polysaccharide extraction and pharmacodynamic
tests. Two strains designated Jinghuai and Xinmu, respectively, were
isolated from the specimens. When the strain Xinmu was cultured on wheat
bran juice at 20, 28 and 35 deg C, respectively, its hyphae grew rapidly
at 35 deg C, but the optimum temperature for basidiospore production was
28 deg C. When the strain Xinmu was cultured on PDA and other natural
substrates, its fruit bodies grew rapidly on PDA and
potato residues, and the shape and texture of its fruit
bodies were alveolate and loose, respectively. Meanwhile, Jinghuai
and Xinmu cultured using a deep fermentation method had **hyphal**
yields of 1.02 and 0.75%, and polysaccharide yields from the fungus liquid
of 0.975 and 0.665%, respectively. The polysaccharide from Xinmu had
protective effects on mouse gastric ulcers while that from Jinghuai did not
have such effects.

AN 2002:137984 CABO

DN 20013141452

TI Preliminary study on *Xanthochrous rheades* culture and the bioactivity of
its products

AU Wang ShuFang; Zhang ShouRen; Xu RuiMing; Wang, S. F.; Zhang, S. R.; Xu, R.
M.

CS Chinese Academy of Medical Sciences, Beijing 100050, China.

SO Edible Fungi of China, (2000) Vol. 19, No. 6, pp. 37-39. 2 ref.

DT Journal

LA Chinese

SL English

L9 ANSWER 22 OF 64 USPATFULL

AB Microbial cells and/or a preparation thereof of a microorganism is
allowed to act on ester of .gamma.-halogenated-acetoacetic acid, and its
carbonyl group at .beta.-position is stereospecifically reduced to
produce ester of (S)-.gamma.-halogenated-.beta.-hydroxybutyric acid in a
short period of time at a highly accumulated degree and at a high yield,
the microorganism being selected from the group consisting of those
belonging to the genera Phoma, Nectria, Pseudonectria, Spondylocladium,
Melanospora, Metarhizium, Gliocladium, Pestalotia, Pestalotiopsis,
Curvularia, Hormonema, Sydowia, Sarcinomyces, Dothiora, Xanthothecium,
Dothidea, Pringsheimia, and Selenophoma.

AN 1999:43433 USPATFULL

TI Method for producing ester of (S)-.gamma.-halogenated-.beta.-
hydroxybutyric acid

IN Yamagishi, Masahiro, Yokohama, Japan
Takai, Yukie, Chiyoda-ku, Japan
Mikawa, Takashi, Yokohama, Japan
Hara, Mari, Yokohama, Japan
Ueda, Makoto, Yokohama, Japan
Ohara, Akiko, Yokohama, Japan

PA Mitsubishi Chemical Corporation, Tokyo, Japan (non-U.S. corporation)

PI US 5891685 19990406
AI US 1997-867820 19970603 (8)
PRAI JP 1996-140087 19960603
DT Utility
FS Granted
EXNAM Primary Examiner: Hendricks, Keith D.; Assistant Examiner: Mayhew,
Bradley S.
LREP Wenderoth, Lind & Ponack, L.L.P.
CLMN Number of Claims: 23
ECL Exemplary Claim: 1
DRWN 10 Drawing Figure(s); 10 Drawing Page(s)
LN.CNT 1747
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L9 ANSWER 23 OF 64 LIFESCI COPYRIGHT 2003 CSA
AB Fungi are familiar to us as mushrooms that we can eat, toadstools that we shouldn't eat, and moulds on food that we have failed to eat. In each case, the visible fungus is composed of thread-like cells called hyphae, which either pack together to form mushrooms fruit bodies or build up into a furry mycelium, or mould. In a paper in Current Biology, Woesten and colleagues reveal that proteins known as hydrophobins constitute the special ingredient that releases these fungal structures from their damp surroundings and enables them to grow up into the air to sporulate. Fungi spend most of their lives encased in a wet environment such as wood, leaf litter or, in the case of pathogenic fungi, plant or animal tissue. Fungi proliferate by producing extensive hyphal networks that spread in all directions, secreting enzymes to degrade complex nutrients into simple sugars which are taken up to sustain the growing cells. To spread to new territory, however, most fungi need to grow into the air and produce spores. These spores are carried on upwardly projecting aerial hyphae or (in the case of sexual spores) in elaborate fruit bodies such as mushrooms and polypores. Woesten et al. have shown that for a fungus to produce aerial structures, it must escape the surface tension of the water that normally surrounds it. This process involves the action of a remarkable class of fungal proteins called hydrophobins. These are small proteins that are secreted in abundance by filamentous fungi. They are very diverse in amino-acid sequence but they all have a set of eight cysteine residues and are predominantly hydrophobic in character. In spite of this diversity, even quite different hydrophobins are functionally interchangeable among species, suggesting that they share conserved physical characteristics. The most extensively studied hydrophobin--and also the one investigated by Woesten et al.--is SC3, a hydrophobin produced by the gill-mushroom fungus *Schizophyllum commune*.

AN 1999:46202 LIFESCI
TI Coming up for air and sporulation
AU Talbot, N.J.
CS Sch. Biol. Sci., Univ. Exeter, Washington Singer Lab., Perry Rd., Exeter EX4 4QG, UK; E-mail: N.J.Talbot@exeter.ac.uk
SO Nature [Nature], (19990325) vol. 398, no. 6725, pp. 295-296.
ISSN: 0028-0836.
DT Journal
FS K
LA English

L9 ANSWER 24 OF 64 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.
AB Developmental variants in fruiting of *Coprinus cinereus* were induced by mutagenizing oidia of the homokaryotic fruiting strain CopD5-12 with UV light. Through screening of 2,696 isolates, 1,018 strains exhibited defects in fruiting and were classified into 8 groups: (1) knotless variants, which fail to form hyphal knots, the first visible sign of fruiting; (2) primordiumless variants, which form hyphal knots but fail to develop fruit-body primordia; (3) maturationless variants, which form fruit-body primordia but do not form mature

fruit bodies; (4) elongationless variants, which form mature fruit bodies with short stipes; (5) expansionless variants, which form mature fruit bodies with unexpanded pilei; (6) sporeless variants, which fail to produce black basidiospores, resulting in fruit bodies with white pilei after maturation; (7) compound type, which includes variants exhibiting several of the phenotypes described above; (8) others, including variants that produce a "dark stipe" even under light/dark conditions, which is formed under continuous darkness in the wild-type. Two elongationless variants were characterized histologically.

AN 1999:540227 BIOSIS

DN PREV199900540227

TI Isolation and characterization of developmental variants in fruiting using a homokaryotic fruiting strain of *Coprinus cinereus*.

AU Muraguchi, Hajime. (1); Takemaru, Tsuneo (1); Kamada, Takashi (1)

CS (1) Department of Biology, Faculty of Science, Okayama University, Tsushima-Naka 3-1-1, Okayama, 700-8530 Japan

SO Mycoscience, (June 15, 1999) Vol. 40, No. 3, pp. 227-233.

ISSN: 1340-3540.

DT Article

LA English

SL English

L9 ANSWER 25 OF 64 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.DUPLICATE
6

AB A microbial population was isolated from young sporocarps of *Tuber borchii* Vittad. to study its possible role in ascus opening. The bacteria in the sporocarps had a mean value of 106 CFU/g and were generally found in quantities higher than that found in the bulk soil (103). In the sporocarps examined the predominant bacteria were *Pseudomonas fluorescens* (30% of the total population) and spore-forming, gram-positive, bacteria (15% of total). These bacterial species were tested to evaluate their capacity to degrade cellulose and chitin, the most important components of the hyphal walls. Ultrastructural examination of the tested sporocarps revealed the presence of bacteria in the interhyphal space, a portion of which were embedded in the ascus wall. It is suggested that the presence of *Pseudomonas* strains and *Bacillaceae* in *T. borchii* Vittad. sporocarps could be related to their chitinolytic and cellulolytic activities, which could in turn be involved in ascus opening and, perhaps, in spore germination.

AN 1999:213296 BIOSIS

DN PREV199900213296

TI Bacteria associated to fruit bodies of the ecto-mycorrhizal fungus *Tuber borchii* Vittad.

AU Gazzanelli, Giancarlo (1); Malatesta, Manuela; Pianetti, Anna; Baffone, Wally; Stocchi, Vilberto; Citterio, Barbara

CS (1) Istituto di Istologia e Analisi di Laboratorio, University of Urbino, via Zeppi, 61029, Urbino Italy

SO Symbiosis, (1999) Vol. 26, No. 3, pp. 211-222.

ISSN: 0334-5114.

DT Article

LA English

SL English

L9 ANSWER 26 OF 64 LIFESCI COPYRIGHT 2003 CSA

AB As a first attempt to investigate evolutionary patterns of spore size in Agarics, I tested whether this trait was correlated to the size of the fruit-body (basidiocarp). Based on phylogenetically independent contrasts, it was shown that big mushroom species had on average 9% longer, 9% wider and 33% more voluminous spores (all with $P < 0.05$, one-tailed tests) than small congeneric species (a three-fold difference in cap diameter was used to discriminate big and small mushrooms). It is argued that larger spore size does not consistently confer higher fitness in fungi, owing to aerodynamic constraints. Surprisingly, the cap-spore correlation was

strongly lineage-specific. Thus, spore volume correlated significantly with cap diameter in five of 16 large genera (four positive and one negative correlation). Positive cap-spore correlations are interpreted in terms of developmental constraints, mediated by hyphal swelling during cap expansion. The possible mechanisms which can account for the breakdown of this constraint in the majority of genera investigated are discussed.

AN 1999:76313 LIFESCI
TI The evolution of spore size in Agarics: do big mushrooms have big spores?
AU Meerts, P.
CS Laboratoire de Genetique et Ecologie vegetales, Universite Libre de Bruxelles, Chaussee de Wavre 1850, B-1160 Bruxelles, Belgium; E-mail: pmeerts@ulb.ac.be
SO Journal of Evolutionary Biology [J. Evol. Biol.], (19990100) vol. 12, no. 1, pp. 161-165.
ISSN: 1010-061X.
DT Journal
FS D; K
LA English
SL English

L9 ANSWER 27 OF 64 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.
AB Hydrophobins are small (length, about 100 +- 25 amino acids), cysteine-rich, hydrophobic proteins that are present in large amounts in fungal cell walls, where they form part of the outermost layer (rodlet layer); sometimes, they can also be secreted into the medium. Different hydrophobins are associated with different developmental stages of a fungus, and their biological functions include protection of the hyphae against desiccation and attack by either bacterial or fungal parasites, hyphal adherence, and the lowering of surface tension of the culture medium to permit aerial growth of the hyphae. We identified and isolated a hydrophobin (fruit body hydrophobin 1 (Fbh1)) present in fruit bodies but absent in both monokaryotic and dikaryotic mycelia of the edible mushroom *Pleurotus ostreatus*. In order to study the temporal and spatial expression of the fbh1 gene, we determined the N-terminal amino acid sequence of Fbh1. We also synthesized and cloned the double-stranded cDNA corresponding to the full-length mRNA of Fbh1 to use it as a probe in both Northern blot and in situ hybridization experiments. Fbh1 mRNA is detectable in specific parts of the fruit body, and it is absent in other developmental stages.

AN 1998:501581 BIOSIS
DN PREV199800501581
TI Identification, characterization, and in situ detection of a fruit-body-specific hydrophobin of *Pleurotus ostreatus*.
AU Penas, Maria M.; Asgeirsdottir, Sigridur A.; Lasa, Inigo; Culianez-Macia, Francisco A.; Pisabarro, Antonio G.; Wessels, Joseph G. H.; Ramirez, Lucia (1)
CS (1) Departamento de Produccion Agraria, Universidad Publica de Navarra, E-31006 Pamplona Spain
SO Applied and Environmental Microbiology, (Oct., 1998) Vol. 64, No. 10, pp. 4028-4034.
ISSN: 0099-2240.
DT Article
LA English

L9 ANSWER 28 OF 64 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.DUPLICATE
7
AB Hyphal growth of the white button mushroom *Agaricus bisporus* on spawn grains and compost is typically vegetative. Hyphae are loosely arranged, in contrast to the organized texture in tissues, and needle-like calcium oxalate crystals are frequently present on the surface of vegetative hyphae. The mycelial cord is the first well-organized tissue of the fruiting mycelium; it is surrounded by fluffy white hyphae that grow vegetatively. The hyphae of the cord are held together through a

semi-fluid medium, the extracellular matrix, which aids in creating a three-dimensional pseudoparenchymatous structure. The matrix material seems to be secreted into the extracellular environment by specifically differentiated cells, but the vegetatively growing hyphae of *A. bisporus* initially exploit a different mechanism in the production of matrix which involves a type of cell death different from cell necrosis. This primary matrix production leads to the formation of minute cord tissues in which oxalate crystals are no longer present. Once the **hyphal** cells of *A. bisporus* pass the threshold from a vegetative form into organized structures, they become differentiated and self-maintaining in the production of the extracellular matrix material. Morphogenetic cell death has been observed before in *A. bisporus* development and here we show that it occurs in various species of macrofungi: a mucoid zone of the *pileipellis* typically found in developing **fruit bodies** of *Psilocybe*-and *Panaeolus* spp. contains numerous, dying or dead **hyphal** cells which show ultrastructural features comparable to those observed during the mycelial cord formation of *A. bisporus*. Studies performed using specimens of *Stropharia rugoso-annulata*, *Coprinus domesticus*, *Psathyrella candolleana*, *Tremella mesenterica*, *Otidea onotica* and *Peziza ostracoderma* in representative growth stages revealed supporting evidence for the view that morphogenetic cell death plays a key role at different stages during the development of fungal **fruit bodies**. This phenomenon may be related to the programmed cell death occurring in developing plants and animals.

AN 1998:352684 BIOSIS
DN PREV199800352684
TI The role of morphogenetic cell death in the histogenesis of the mycelial cord of *Agaricus bisporus* and in the development of macrofungi.
AU Umar, M. Halit; Van Griensven, Leo J. L. D.
CS Mushroom Exp. Stn., P.O. Box 6042, 5960 AA Horst Netherlands
SO Mycological Research, (June, 1998) Vol. 102, No. 6, pp. 719-735.
ISSN: 0953-7562.
DT Article
LA English

L9 ANSWER 29 OF 64 LIFESCI COPYRIGHT 2003 CSA
AB Fungal hydrophobins are secreted proteins which react to interfaces between fungal cell walls and the air or between fungal cell walls and solid surfaces. They have been shown to be important in many morphogenetic processes, including sporulation, fruit body development, and infection structure formation. Hydrophobins form hydrophobic surface layers by self-assembly of secreted protein monomers in response to the environment. This process results in amphipathic polymers of interwoven rodlets on surfaces of fungal aerial structures and **hyphal** aggregations. Hydrophobin self-assembly is also involved in attachment of hyphae to hydrophobic surfaces and this may act as a conformational cue for certain developmental processes. Although hydrophobins appear to be ubiquitous among fungal taxa, a second class of fungal protein with very different biochemical characteristics could fulfill a similar role. These proteins, called repellents, have been identified in only one fungal species so far, but clearly help to make aerial hyphae hydrophobic. The functional similarities between hydrophobins and repellents highlight the importance of aerial development to the fungal lifestyle.
AN 1998:102788 LIFESCI
TI Hydrophobins and repellents: Proteins with fundamental roles in fungal morphogenesis
AU Kershaw, M.J.; Talbot, N.J.
CS Washington Singer Laboratories, Department of Biological Sciences, University of Exeter, Perry Road, Exeter EX4 4QG, UK
SO Fungal Genet. Biol., (19980200) vol. 23, no. 1, pp. 18-33.
ISSN: 1087-1845.
DT Journal
FS G; K
LA English

SL English

L9 ANSWER 30 OF 64 CABA COPYRIGHT 2003 CABI

AB Fruit bodies of *A. bisporus* grown in a protected cultivation environment had a life span of 36 days. Morphological changes occurring in aging mushrooms are described. Signs of senescence became visible around day 18. Cytologically, karyolysis and focal cytoplasmolysis were the first signs of senescence, followed by indications of increased permeability of the cytoplasmic membranes and by structural changes of the cell wall. These changes result in extracellular aggregations of the lytic cell remains encapsulating or bridging the hyphal cells. Cells of the stipe tissues were transformed to empty cylinders or had irregularly collapsed. Most basidia and subhymenial cells remained alive even on day 36. When the mushrooms were cultivated according to usual growth procedures, about 50% of the fruit bodies were infected by *Trichoderma harzianum* and/or *Pseudomonas tolaasii* on day 18; all fruit bodies died on day 24 due to diffuse bacterial and mycotic infections manifesting themselves by tissue necrosis and discoloration of the caps and stipes. When none of the fruit bodies was harvested at the time of the first flush they soon formed a canopy of pilei and their growth ceased. Postharvest fruit bodies kept at ambient temperature or at 2 deg C at low RH, or at 20 deg at high RH, revealed diffuse cell wall destruction which was followed by cytoplasmic degeneration in due course. Fruit bodies kept refrigerated had the least gross and cell structural changes over a period of 7 days. It is concluded that the morphological changes occurring in harvested fruit bodies and in senescent fruit bodies of *A. bisporus* are different.

AN 1998:62189 CABA

DN 980303794

TI Morphological studies on the life span, developmental stages, senescence and death of fruit bodies of *Agaricus bisporus*

AU Umar, M. H.; Griesven, L. J. L. D. van; Van Griesven, L. J. L. D.

CS Mushroom Experimental Station, P.O. Box 6042, 5960 AA Horst, Netherlands.

SO Mycological Research, (1997) Vol. 101, No. 12, pp. 1409-1422. 10 ref.

ISSN: 0953-7562

DT Journal

LA English

L9 ANSWER 31 OF 64 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.DUPLICATE 8

AB Growing fruit bodies of *Agaricus bisporus* and *Amanita muscaria* responded with regenerating white hyphae to cell and tissue injuries caused by intrapileal needle insertion and leuocofuchsin injection. We point out reserve cells as a possible source of regenerating hyphae in the wound repair. Such reserve cells were not found in the partial veil and in the surface covering. Damage of the partial veil remained unrepaired and caused lamellar dysplasia. Hydrophilic, somatic tissues reacted immediately and strongly with leuocofuchsin, whereas hyphae of the surface covering and partial veil showed a delayed and weak reaction. We explain this by the presence of an extracellular matrix, which consists of hydrophilic mucilaginous substances around tissue-forming hyphae. Transmission and scanning electron microscopical studies revealed that white hyphae were deprived of such matrix material. We conclude that for fungal tissue formation the hyphae have to be capable of producing a substantial amount of extracellular matrix material beyond the cell wall.

AN 1997:492831 BIOSIS

DN PREV199799792034

TI Hyphal regeneration and histogenesis in *Agaricus bisporus*.

AU Umar, M. Halit; Van Griesven, Leo J. L. D.

CS Mushroom Experimental Station, P.O. Box 6042, 5960 AA Horst Netherlands

SO Mycological Research, (1997) Vol. 101, No. 9, pp. 1025-1032.

- ISSN: 0953-7562.
- DT Article
- LA English
- L9 ANSWER 32 OF 64 CABA COPYRIGHT 2003 CABI
- AB A short account is given of the current status of research worldwide into techniques for the production of the chanterelle, *Cantharellus cibarius*. One of the major obstacles that has delayed laboratory research on this species is the high infection rate of the fruit bodies with large numbers of microorganisms, especially fluorescent *Pseudomonas* bacteria. Details are given of recent work in isolating the mycelium in pure culture. It was cultivated in a liquid medium to obtain mycorrhizas. A *hyphal* suspension was then added to young *Pinus sylvestris* seedlings cultivated under axenic conditions with a nutrient solution containing glucose. When the mycorrhizas formed, the seedlings were transferred to non-sterile pots placed in a greenhouse. After one year the external mycelium of the mycorrhizas is large enough to support fruit body formation.
- AN 1998:81369 CABA
- DN 980607699
- TI Progress in chanterelle (*Cantharellus cibarius*) cultivation
Les progres dans la maitrise de la culture de la chanterelle, *Cantharellus cibarius*
- AU Danell, E.
- CS Department of Forest Mycology and Pathology, Swedish University of Agricultural Sciences, Box 7026, S-750 07 Uppsala, Sweden.
- SO Revue Forestiere Francaise, (1997) Vol. 49, No. Numero special, pp. 214-221. 43 ref.
- Meeting Info.: Champignons et mycorhizes en foret.
- DT Journal
- LA French
- SL English
- L9 ANSWER 33 OF 64 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.
- AB Ultrastructure of *hyphal* cells in fruit body primordia of 0.17 and 0.34 mm in height (primary meristemoids) and cells of secondary meristemoids confined to the pileus margins, upper portion of the stipe and initiating gills in developing fruit bodies at various stages were studied. Characteristic for both types of meristemoids was the presence of poorly vacuolated cells which division was considered to contribute to the fruit body growth. Fully mature cystidia were described on the primordia. Cells at various stages of vacuolation were found to be randomly distributed along the same hypha in the primordia.
- AN 1999:135836 BIOSIS
- DN PREV199900135836
- TI Ultrastructure of primordia and secondary meristemoids of *Flammulina velutipes* (Curt.: Fr.) P. Karst. (Tricholomataceae) fruit bodies.
- AU Koida, M. A.; Stepanova, A. A.
- CS Inst. Bot., Cent. Bot. Gard., Acad. Sci. Turkmenistan, Ashgabat Turkmenistan
- SO Mikologiya i Fitopatologiya, (1997) Vol. 31, No. 5, pp. 33-39.
ISSN: 0026-3648.
- DT Article
- LA Russian
- SL English
- L9 ANSWER 34 OF 64 CABA COPYRIGHT 2003 CABI
- AB A disease that causes knots on the gills of the oyster mushroom, *Pleurotus ostreatus*, has been reported from western Japan. Nematodes inhabit and lay many eggs inside the gill knots. It is surprising that the nematodes causing this disease live in the fruiting body of this fungus, which is known to be nematophagous. In the present study, the fungus gnat *Rhymosia*

domestica (Mycetophilidae, Diptera) was confirmed to be the vector of the nematodes inside the gill knots. This nematode has different adult stages, i.e., a mycetophagous adult female, an adult female, infective to the fungus gnat, an adult male, and a mature entomophagous adult female. The occurrence of gill-knot disease was investigated in the field. Laboratory experiments determined that the fungus gnat could not itself form gill knots, because formation of knots was not observed on the gills of **fruits bodies** incubated with nematode-free gnats.

Observation by means of microscopy and the spore patterns of diseased fruiting bodies confirmed that the knots consisted of dedifferentiated **hyphal tissues**, which do not form spores.

AN 97:53672 CABA
DN 971700401
TI The tripartite relationship in gill-knot disease of the oyster mushroom,
Pleurotus ostreatus (Jacq.: Fr.) Kummer
AU Tsuda, K.; Kosaka, H.; Futai, K.
CS Laboratory of Applied Botany, Faculty of Agriculture, Kyoto University,
Kyoto 606, Japan.
SO Canadian Journal of Zoology, (1996) Vol. 74, No. 8, pp. 1402-1408. 7 ref.
ISSN: 0008-4301
DT Journal
LA English
SL French

L9 ANSWER 35 OF 64 CABA COPYRIGHT 2003 CAB
AB The anatomical and morphological characteristics of ectomycorrhizas formed by *L. deliciosus* and *L. hatsudake* are described. The mycorrhizal relation between these fungi and pines was identified by tracing the **hyphal connections to fruit bodies**. They could be differentiated on mycorrhizal colour and lactiferous hyphae. A key to mycorrhizas described in *Lactarius* is provided.

AN 97:100457 CABA
DN 971004994
TI Ectomycorrhizae formed by **fungi** in the genus *Lactarius* on *Pinus*
AU Huang YiCun; Huang YongQing; Wang YouZhi; Huang, Y. C.; Huang, Y. Q.;
Wang, Y. Z.
CS Institute of Microbiology, Chinese Academy of Sciences, Beijing 100080,
China.
SO Acta Mycologica Sinica, (1996) Vol. 15, No. 4, pp. 278-283. 7 ref.
ISSN: 0256-1883
DT Journal
LA Chinese
SL English

L9 ANSWER 36 OF 64 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.
AB In search for the cellular mechanisms of graviperception in basidiomycete **fruit bodies**, nuclear and vacuole motility was investigated in the fungus, *Flammulina velutipes*. In this organism, **hyphal nuclei** are closely linked with the actin cytoskeleton, which is involved in gravity perception. Active motion of the nuclei appears aligned with the axis of gravity, and is maintained after spatial reorientation of the cell. The vacuoles showed low motility not aligned with the gravity axis at all. The nuclear density was determined with 1.22 g/cm⁻³. Calculation of the forces exerted by the nuclei shows that nuclear displacement in the submicrometer range already fulfills the physical minimum condition for a statolith. Based on these findings, a function of nuclei as statoliths in basidiomycete hyphae is proposed.

AN 1996:572837 BIOSIS
DN PREV199799287518
TI Cellular graviperception in the basidiomycete *Flammulina velutipes*: Can the nuclei serve as fungal statoliths.
AU Monzer, Jan
CS Sect. Plant Biol., Div. Biol. Sci., Univ. Calif., Davis, CA 95616 USA
SO European Journal of Cell Biology, (1996) Vol. 71, No. 2, pp. 216-220.

ISSN: 0171-9335.
DT Article
LA English

L9 ANSWER 37 OF 64 CAPLUS COPYRIGHT 2003 ACS DUPLICATE 9
AB A review with 60 refs. Although the orientation of mycelial hyphal growth is usually independent of the gravity vector, individual specialized hyphae can show response to gravity. This is exemplified by the sporangiophore of Phycomyces, but the most striking gravitropic reactions occur in mushroom fruit bodies. During the course of development of a mushroom different tropisms predominate at different times; the young fruit body primordium is pos. phototropic, but neg. gravitropism later predominates. The switch between tropisms has been assocd. with meiosis. The spore-bearing tissue is pos. gravitropic and responds independently of the stem. Bracket polypores do not show tropisms but exhibit gravimorphogenetic responses: disturbance leads to renewal of growth producing an entirely new fruiting structure. Indications from both clinostat and space flown expts. are that the basic form of the mushroom (overall tissue arrangement of stem, cap, gills, hymenium, veil) is established independently of the gravity vector although maturation, and esp. commitment to the meiosis-sporulation pathway, requires the normal gravity vector. The gravity perception mechanism is difficult to identify. The latest results suggest that disturbance of cytoskeletal microfilaments is involved in perception (with nuclei possibly being used as statoliths), and Ca²⁺-mediated signal transduction may be involved in directing growth differentials.

AN 1995:798592 CAPLUS
DN 123:193125
TI Graviresponses in fungi
AU Moore, D.
CS School Biological Sciences, University Manchester, Manchester, M13 9PT, UK
SO Advances in Space Research (1996), 17(6/7, Life and Gravity: Physiological and Morphological Responses), 73-82
CODEN: ASRSDW; ISSN: 0273-1177
PB Elsevier
DT Journal; General Review
LA English

L9 ANSWER 38 OF 64 CABIA COPYRIGHT 2003 CABI DUPLICATE 10
AB An RT-PCR test for the presence of one of the La France disease-specific dsRNAs in pure cultures of *A. bisporus*, fruit bodies, spawn and spawn run compost was optimized. A sensitive and reliable test is now available for the detection of viral dsRNA at any stage of the cultivation of mushrooms. A collection of wild isolates of *A. bisporus* was tested for the presence of disease-specific viral dsRNAs. No dsRNAs were found. DsRNAs could be transferred repeatedly from one commercial line to another by hyphal anastomosis. Attempts to transfer dsRNAs from an infected commercial line to 6 wild isolates, however, were not successful.

AN 97:49979 CABIA
DN 971002556
TI Detection of *Agaricus bisporus* viral dsRNAs in pure cultures, spawn and spawn-run compost by RT-PCR
AU Sonnenberg, A. S. M.; Kempen, I. P. J. van; Griensven, L. J. L. D. van; Van Kempen, I. P. J.; Van Griensven, L. J. L. D.; Elliott, T. J. [EDITOR]
CS Mushroom Experimental Station, Horst, Netherlands.
SO Science and cultivation of edible fungi, volume 2: Proceedings of the 14th International Congress, Oxford, 17-22 September 1995, (1995) pp. 587-594. 11 ref.
Publisher: A.A. Balkema. Rotterdam
Meeting Info.: Science and cultivation of edible fungi, volume 2: Proceedings of the 14th International Congress, Oxford, 17-22 September 1995.
ISBN: 90-5410-572-0

CY Netherlands Antilles
DT Conference Article
LA English

L9 ANSWER 39 OF 64 CABAB COPYRIGHT 2003 CABI

AB During the past 3 years, clusters and malformations have occurred on a large scale in mushroom crops on Dutch farms. Data obtained from affected crops showed no correlation with the origin of basic materials, i.e. compost, casing soil or spawn. In addition, no correlations were found with climate controls or cultivation techniques used by growers. However, a clear correlation was found with certain spawn batches. Extreme variations in climate and in cultivation techniques applied in test facilities did not evoke any symptoms. Furthermore, compost could not be colonized with spawn prepared from tissue cultures from clusters and malformed fruit bodies. Microscopical examination of mycelium derived from clusters and malformed fruit bodies showed a change in **hyphal morphology**. No evidence was found for the presence of pathogens. When protoplasts were derived from tissue cultures derived from **fruit bodies** with symptoms, only one type of homokaryon could be recovered. Genetic analysis, however, showed that no deheterokaryotization had occurred and no indications were found for chromosomal loss.

AN 96:17040 CABAB

DN 960300870

TI Clusters and malformation in crops of the white button mushroom *Agaricus bisporus*

AU Sonnenberg, A. S. M.; Amsing, J. G. M.; Tonnissen, E. L. R. T. M.; Griensven, L. J. L. D. van; Van Griensven, L. J. L. D.; Elliott, T. J. [EDITOR]

CS Mushroom Experimental Station, Horst, Netherlands.

SO Mushroom science XIV, Volume 2. Proceedings of the 14th international congress on the science and cultivation of edible fungi, Oxford, UK, 17-22 Sep. 1995, (1995) pp. 549-556. 2 pl. 7 ref.

Publisher: A. A. Balkema. Rotterdam

Meeting Info.: Mushroom science XIV, Volume 2. Proceedings of the 14th international congress on the science and cultivation of edible fungi, Oxford, UK, 17-22 Sep. 1995.

ISBN: 90-5410-572-0

CY Netherlands Antilles

DT Conference Article

LA English

L9 ANSWER 40 OF 64 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.DUPLICATE
11

AB Ectomycorrhizas were synthesized in pots and growth pouches between *Quercus serrata*, *Q. acutissima*, and two ectomycorrhizal fungi, *Pisolithus tinctorius* and *Hebeloma cylindrosporum*. Root morphology and the structure of the mantle and Hartig net were compared using light, fluorescence, scanning and transmission electron microscopy. *P. tinctorius* initially colonized root cap cells, and eventually produced a highly branched lateral root system with a complete mantle, whereas *H. cylindrosporum* promoted root elongation with few hyphae on the root apex surface indicating that interaction between roots differs with fungal species. Hartig net structure and hyphal inclusions varied between all the combinations tested. There were structural differences between mycorrhizas of *H. cylindrosporum/Q. acutissima* grown in soil and growth pouches, which indicate that the growth pouch environment can induce artefacts in roots. **Fruit bodies** of *H. cylindrosporum* developed in pots with *Q. acutissima*. Although *P. tinctorius* has been used to inoculate oak seedlings in the nursery, results of this study indicate that *H. cylindrosporum* may also be an effective ectomycorrhizal fungus for *Q. serrata* and *Q. acutissima*.

AN 1995:169885 BIOSIS

DN PREV199598184185

TI Comparative structural study of *Quercus serrata* and *Q. acutissima* formed by *Pisolithus tinctorius* and *Hebeloma cylindrosporum*.
AU Oh, K. I.; Melville, L. H.; Peterson, R. L. (1)
CS (1) Dep. Botany, Univ. Guelph, Guelph, ON N1G 2W1 Canada
SO Trees (Berlin), (1995) Vol. 9, No. 3, pp. 171-179.
ISSN: 0931-1890.
DT Article
LA English

L9 ANSWER 41 OF 64 SCISEARCH COPYRIGHT 2003 THOMSON ISI
AB Although the orientation of mycelial **hyphal** growth is usually independent of the gravity vector, individual specialised hyphae can show response to gravity. This is exemplified by the sporangiophore of *Phycomyces*, but the most striking gravitropic reactions occur in mushroom fruit bodies. During the course of development of a mushroom different tropisms predominate at different times; the young fruit body primordium is positively phototropic, but negative gravitropism later predominates. The switch between tropisms has been associated with meiosis. The spore-bearing tissue is positively gravitropic and responds independently of the stem. Bracket polypores do not show tropisms but exhibit gravimorphogenetic responses: disturbance leads to renewal of growth producing an entirely new fruiting structure. Indications from both clinostat and space flown experiments are that the basic form of the mushroom (overall tissue arrangement of stem, cap, gills, hymenium, veil) is established independently of the gravity vector although maturation, and especially commitment to the meiosis-sporulation pathway, requires the normal gravity vector. The gravity perception mechanism is difficult to identify. The latest results suggest that disturbance of cytoskeletal microfilaments is involved in perception (with nuclei possibly being used as statoliths), and Ca²⁺-mediated signal transduction may be involved in directing growth differentials.

AN 95:638660 SCISEARCH
GA The Genuine Article (R) Number: BD67H
TI GRAVIRESPONSES IN FUNGI
AU MOORE D (Reprint)
CS UNIV MANCHESTER, SCH BIOL SCI, 1800 STOPFORD BLDG, MANCHESTER M13 9PT, LANCS, ENGLAND (Reprint)
CYA ENGLAND
SO ADVANCES IN SPACE RESEARCH, (1995) Vol. 17, No. 6-7, pp. 73-82.
ISSN: 0273-1177.
DT Article; Journal
LA ENGLISH
REC Reference Count: 60
ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

L9 ANSWER 42 OF 64 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.
AB Close study of primordial **fruit-bodies** of this species shows that, while there is no gill-cavity, the gills develop as centrifugal ridges of downgrowing **hyphal** tips, as usual for agarics, but these ridges grow into the tissue of the partial veil (annulus). The gill-ridges construct at once the lateral stratum (thick subhymenium), as the cortication of a multifilamentous medulla.
AN 1995:254842 BIOSIS
DN PREV199598269142
TI The development of the gills in *Amanita rubescens* (Fr.) S. F. Gray.
AU Corner, E. J. H.
CS 91 Hinton Way, Great Shelford, Cambridge CB2 5AH UK
SO Nova Hedwigia, (1994) Vol. 58, No. 1-2, pp. 145-152.
ISSN: 0029-5035.
DT Article
LA English

L9 ANSWER 43 OF 64 SCISEARCH COPYRIGHT 2003 THOMSON ISI
AB The *Schizophyllum commune* hydrophobin Sc3p is a small, hydrophobic,

cysteine-rich protein involved in the formation of aerial hyphae. Using an antibody against purified Sc3p we found that the hydrophobin is secreted into the medium at the spores of growing submerged hyphae but in emerging aerial hyphae it accumulates at the **hyphal** surface. Here, the hydrophobin self-assembles at the wall/air interface into an SDS-insoluble protein membrane, at the aerial site very hydrophobic and with the appearance of a mosaic of 10 nm spaced parallel rodlets. Interfacial self-assembly of the hydrophobin also occurs *in vitro*. When solutions containing various concentrations of purified Sc3p were dried down onto a glass surface, the amount of assembled Sc3p depended on the area of the interface. Surplus of Sc3p remained in the monomeric form, apparently because formation of a monolayer of assembled Sc3p abolishes the hydrophilic/hydrophobic interface. The 10 nm thick layer of assembled Sc3p at the surface of aerial hyphae thus probably represents a monolayer of the protein.

AN 94:172475 SCISEARCH
GA The Genuine Article (R) Number: MZ232
TI THE FUNGAL HYDROPHOBIN SC3P SELF-ASSEMBLES AT THE SURFACE OF AERIAL HYPHAE AS A PROTEIN MEMBRANE CONSTITUTING THE HYDROPHOBIC RODLET LAYER
AU WOSTEN H A B; ASGEIRSDOTTIR S A; KROOK J H; DRENTH J H H; WESSELS J G H (Reprint)
CS UNIV GRONINGEN, CTR BIOL, DEPT PLANT BIOL, KERKLAAN 30, 9751 NN HAREN, NETHERLANDS (Reprint); UNIV GRONINGEN, CTR BIOL, DEPT PLANT BIOL, 9751 NN HAREN, NETHERLANDS
CYA NETHERLANDS
SO EUROPEAN JOURNAL OF CELL BIOLOGY, (FEB 1994) Vol. 63, No. 1, pp. 122-129.
ISSN: 0171-9335.
DT Article; Journal
FS LIFE
LA ENGLISH
REC Reference Count: 28
ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

L9 ANSWER 44 OF 64 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.
AB The Sc7 and Sc14 genes are specifically expressed in the dikaryon of the basidiomycete fungus *Schizophyllum commune* during fruiting. These genes are closely linked (within 6 kb) and highly similar in gene structure and nucleotide sequence (70% identical nucleotides in their coding regions). The encoded proteins (204 and 214 amino acids, respectively) have 87% similarity in amino acids (56% of the amino acids are identical). They contain putative signal sequences for secretion, are rich in aromatic amino acids which are generally located at similar positions, and they are generally hydrophilic. Inspection of databanks showed similarities with pathogenesis-related proteins (PR1) from plants, testis-specific proteins from mammals and venom allergen proteins from insects. An antibody raised against a Sc7 fusion protein showed the presence of the Sc7 protein in the culture medium and in the fruit bodies where it is apparently loosely associated with **hyphal** walls.

AN 1993:523001 BIOSIS
DN PREV199396136408
TI The Sc7/Sc14 gene family of *Schizophyllum commune* codes for extracellular proteins specifically expressed during fruit-body formation.
AU Schuren, Frank H. J. (1); Asgeirsdottir, Sigridur A.; Kothe, Erika M.; Scheer, Jose M. J.; Wessels, Joseph G. H.
CS (1) Dep. Plant Biol., Biol. Centre, Univ. Groningen, Kerklaan 30, 9751 NN Haren Netherlands Antilles
SO Journal of General Microbiology, (1993) Vol. 139, No. 9, pp. 2083-2090.
ISSN: 0022-1287.
DT Article
LA English

L9 ANSWER 45 OF 64 SCISEARCH COPYRIGHT 2003 THOMSON ISI
AB With the exception of the unicellular yeasts, fungi typically grow by means of hyphae that extend only at their apices and ramify into a

mycelium. This mode of growth provides fungi with a certain mobility and the ability to invade dead and living organic substrata. They are thus the main decomposers of plant residues but they also have established intricate symbiotic relationships with plants, both mutualistic and parasitic.

The process of apical growth of a hypha requires the controlled expansion of the apical wall which must be transformed subsequently into a wall that resists turgor pressure and maintains the tubular shape of the hypha. Although the driving force for **hyphal** extension is probably the turgor pressure, a subtle interplay between wall extension and cytoplasmic activity is necessary because only a precise gradient of wall-synthetic activity can maintain uniform wall thickness during expansion. Possibly, the presence in the plasma membrane of mechano-sensitive proteins plays a role in conjunction with the cytoskeleton at the apex, particularly actin. Although the major structural wall polysaccharides are probably manufactured directly on the expanding apical plasma membrane, proteins (and probably some wall components) are delivered to the growing surface by a continuous stream of exocytotic vesicles that fuse with the plasma membrane, at the same time extending its surface.

Our analyses of the chemistry of the fungal wall and its biosynthesis and assemblage have disclosed a simple mechanism (though complex in detail) that may explain the transition from a newly formed expandable wall at the apex to a more rigid wall at the base of the **hyphal** extension zone. Two individual wall polymers, chitin and beta-glucan, extruded at the apex are modified within the domain of the wall. Among the modifications observed are the formation of covalent crosslinks between these two polymers and hydrogen bonds between the homologous polymer chains, leading to the formation of chitin microfibrils crosslinked to a glucan matrix. This process is thought to convert an initially plastic wall into a rigid wall as the polymers fall behind the advancing tip. We have called this the steady-state growth theory for apical wall extension because a steady-state amount of plastic wall is always maintained at the growing apex.

Excretion of lytic enzymes is a vital process in filamentous fungi because, in nature, they thrive on organic polymers which must be degraded extracellularly. Such enzymes are also necessary for infection processes. Cytological data suggest that such enzymes are extruded by the vesicles that continuously fuse with the plasma membrane at the growing apex. We have shown that a large portion of the excreted enzymes indeed leaves the hypha at the growing apex but another portion may be retained by the wall and is slowly released into the medium. In relation to the steady-state growth theory we hypothesize that enzymes can pass the wall at the apex by bulk flow, that is, by being carried by the flow of plastic wall material, making pores in the wall less important than previously thought,

Proteins excreted by filamentous fungi not only serve dissimilatory purposes but are also important for a variety of other activities of the whole mycelium, including morphogenesis. By cloning genes abundantly expressed during formation of aerial hyphae and **fruit bodies**, we have discovered a class of proteins, named hydrophobins, which are only produced when the mycelium has reached a certain stage of maturity. Whilst excreted by submerged hyphae as monomers into the medium, they self-assemble as insoluble complexes in the walls of emergent hyphae. In aerial hyphae a particular hydrophobin takes the form of rodlets which probably coat the hyphae with an impermeable layer. During fruit-body formation other hydrophobins are produced which may function in the aggregation of hyphae to form a multicellular tissue. Apart from such specific morphogenetic functions, the hydrophobins may play a general role in insulating hyphae from the environment, converting the differentiating structures into sinks for translocation of water and nutrients from the assimilating mycelium.

TI WALL GROWTH, PROTEIN EXCRETION AND MORPHOGENESIS IN FUNGI
AU WESSELS J G H (Reprint)
CS UNIV GRONINGEN, DEPT PLANT BIOL, KERKLAAN 30, 9751 NN HAREN, NETHERLANDS
(Reprint)
CYA NETHERLANDS
SO NEW PHYTOLOGIST, (MAR 1993) Vol. 123, No. 3, pp. 397-413.
ISSN: 0028-646X.
DT General Review; Journal
FS AGRI
LA ENGLISH
REC Reference Count: 143
ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

L9 ANSWER 46 OF 64 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.
AB Measurement of video recordings of mushroom growth seemed to reveal a stepwise mode of stipe elongation in **fruit bodies** of *Coprinus cinereus* and *Agaricus bisporus* in which brief episodes of explosive growth were followed by quiescent periods which could last many minutes. Similar stepped growth curves were obtained for **hyphal** extension growth in agar cultures. The stepped nature of these growth curves proved to be an artifact, probably caused by the fact that the video image is composed of a defined number of lines, phosphor dots and/or pixels. An easy test to verify the reality of any discontinuities in such observations is to make video records at a range of magnifications. If the steps (or other discontinuities) are real their absolute magnitude will be unchanged by the altered magnification (though the precision of the measurement will increase). If the steps are artifacts, their apparent absolute magnitude will decline at higher magnifications because the line interval in the image corresponds to a smaller absolute distance on the subject.

AN 1993:504992 BIOSIS
DN PREV199396128999
TI Artifacts in video measurements cause growth curves to advance in steps.
AU Hammad, Farida; Walting, Roy; Moore, David (1)
CS (1) Dep. Cell Structural Biol., Stopford Building, The University,
Manchester M13 9PT UK
SO Journal of Microbiological Methods, (1993) Vol. 18, No. 2, pp. 113-117.
ISSN: 0167-7012.
DT Article
LA English

L9 ANSWER 47 OF 64 EMBASE COPYRIGHT 2003 ELSEVIER SCI. B.V.
AB (1) A series of factors controls sexual morphogenesis in the Ascomycotina, a process involving the formation of novel structures such as ascocarps (**fruit bodies**) and asci (sacs containing spores) during sexual reproduction. (2) Environmental and genetic factors must be correct before Ascomycetes may sexually reproduce. Compatibility in many heterothallic species is under polygenic control, with the mating type loci and also other genetic factors determining the productivity of sexual crosses. (3) Classical genetic studies have shown that sexual morphogenesis involves the expression of a series of developmentally regulated genes, and this has been confirmed by recent molecular studies which have demonstrated changes in patterns of mRNA and protein synthesis during ascocarp formation. (4) **Hyphal** differentiation leading to the formation of mature **fruit bodies** occurs in response to a series of signals, which include various physical and chemical factors. (5) Chemical sex factors have been identified which are believed to have important regulatory or nutritional roles in sexual morphogenesis. These include the following. (a) Diffusible sex hormones which may regulate developmental switching between asexual and sexual modes of reproduction, including (i) pheromones involved with the induction of gametangia and gamete attraction, and (ii) sex morphogens involved with triggering particular stages of fruit body formation. (b) Sexual growth substances which are required as nutrients, and may be

precursors for the production of sex hormones, or metabolites used in the synthesis of novel sexual structures. Most of these sex factors are lipids. (6) Certain sex morphogens and sexual growth substances have been shown to exhibit activity in a variety of fungal species, suggesting that fungi of related phylogenetic descent may utilize similar metabolites or signalling factors during sexual reproduction. (7) Phenoloxidase enzymes may catalyse hyphal aggregation in developing fruit bodies. (8) Initial stages of ascocarp development may occur independently of the events of the sexual cycle. However, a link(s) with the functional ascogenous hyphae is needed for the formation of morphologically mature ascocarps. (9) Suitable environmental conditions are sufficient to trigger sexual morphogenesis in homothallic Ascomycetes. However, an extra level of control is present in heterothallic species, with a compatible partner required to complete sexual reproduction. This may be partly because novel regulatory products, formed by the combined action of the mating type loci of different partners, are required for further ascocarp development. (10) Further research is required to identify more fungal chemical sex factors and to determine the role of environmental stress in controlling sexual morphogenesis, and how this may be related to temporal patterns in the expression of mating type genes.

AN 93002657 EMBASE
DN 1993002657
TI The control of sexual morphogenesis in the Ascomycotina.
AU Dyer P.S.; Ingram D.S.; Johnstone K.
CS Department of Life Sciences, University of Nottingham, Nottingham NG7 2RD, United Kingdom
SO Biological Reviews of the Cambridge Philosophical Society, (1992) 67/4 (421-458).
ISSN: 0006-3231 CODEN: BRCPAH
CY United Kingdom
DT Journal; General Review
FS 004 Microbiology
LA English
SL English

L9 ANSWER 48 OF 64 CABA COPYRIGHT 2003 CABI
AB Hyphal and mycelial interactions within progeny sets of single basidiospore isolates derived from *H. annosum* fruit bodies from various parts of the northern hemisphere were studied microscopically using microculture chambers and with pairing tests, respectively. The behaviour within different sets was highly variable with respect to mating, nuclear exchange, morphogenetic patterns and somatic rejection responses. Evidence was obtained that rapid nuclear migration can occur between certain strains. An unusually large proportion of pairings (84%) produced stable heterokaryons, as determined from back pairings with original homokaryons, of which 54% possessed clamp connections and 46% did not. Studies of isozyme patterns of pectinases of one selected pairing confirmed the presence of clampless heterokaryons. The genetic control of heterokaryosis is complex, with subsidiary systems being superimposed on those which govern formation of clamp-connections and mycelial morphogenesis. The implications of these findings in understanding gene flow within and between natural populations of *H. annosum* are discussed.

AN 91:146404 CABA
DN 912314273
TI Patterns of nuclear migration and heterokaryosis in pairings between sibling homokaryons of *Heterobasidion annosum*
AU Stenlid, J.; Rayner, A. D.
CS Department of Forest Mycology and Pathology, Swedish University of Agricultural Sciences, Box 7026, 750 07 Uppsala, Sweden.
SO Mycological Research, (1991) Vol. 95, No. 11, pp. 1275-1283. 23 ref.
ISSN: 0953-7562
DT Journal

LA English

L9 ANSWER 49 OF 64 CABA COPYRIGHT 2003 CABI

AB Specimens were collected from 5 geographical areas of Greece and cultivated in the laboratory with culture collection strains cultivated in parallel as reference material. Morphological characteristics (fruit bodies, hyphal system, basidiospores, mycelial cultures) were observed and measured. Mycelial growth rates and earliness were measured and cellulose degradation efficacy was estimated. Wheat grains were used as substrate for spawn preparation and a corn cobs substrate was used for mushroom cultivation. Results are tabulated. Four different groups of "wild" *Pleurotus* isolates were established and their morphological characteristics are discussed. The groups were assigned to 4 different species i.e. *P. pulmonarius*, *P. ostreatus*, *P. eryngii* and *P. cystidiosus*. The existence in Europe of *P. cystidiosus* is reported for the first time. Physiological features (earliness, mycelial growth rate and cellulolytic activity) were found to be relatively constant under controlled conditions and could therefore be used together with morphological criteria in *Pleurotus* systematics.

AN 92:97771 CABA

DN 920315442

TI Pleurotus species of Greece: an evaluation of their morphological and physiological characteristics

AU Zervakis, G.; Balis, C.; Maher, M. J. [EDITOR]

CS Laboratory of General and Agricultural Microbiology, Agricultural University of Athens, Greece.

SO (1991) pp. 537-544. 20 ref.
Publisher: A. A. Balkema. Rotterdam
Meeting Info.: Mushroom Science XIII. Volume 2. Proceedings of the 13th international congress on the science and cultivation of edible fungi. Dublin, Irish Republic, 1-6 September, 1991.
ISBN: 90-5410-021-4 (set); 90-5410-023-0 (Vol. 2)

CY Netherlands Antilles

DT Conference Article

LA English

SL French; German

L9 ANSWER 50 OF 64 CABA COPYRIGHT 2003 CABI

AB Ectomycorrhizal short roots, mycelia, rhizomorphs and mats from conifer soil were examined in relation to their hydrophobic properties. In some cases connected fruit bodies were included in the study. Mycorrhizal soils gathered from the forest and/or colonized in a lab. rhizoscope were studied, as were mycelia in pure culture. Most forest-derived species were hydrophobic. The drought-resistant *Cenococcum geophilum* and the more ruderal and moisture-dependent *Thelephora terrestris* were both strongly hydrophilic. The hydrophobic mycelium seemed solely responsible for the water repellence properties, and adjacent soil and plant debris remained unaffected and hydrophilic. In hydrophobic fungi, mat formation was induced in the rhizoscope by hyphal contact with alder litter leaves. This stimulating effect was not found when the leaves were covered by water or when fresh, green alder leaves were used. *Thelephora terrestris* did not form such mats in vitro and spread sparsely in air pockets as well as in the adjacent water film. The possibility that many mycorrhizal fungi in the forest may partly control their soil environment via aeration created by their hydrophobia is discussed.

AN 91:145845. CABA

DN 912313379

TI Water repellency, mat formation, and leaf-stimulated growth of some ectomycorrhizal fungi

AU Unestam, T.

CS Department of Forest Mycology and Pathology, Swedish University of Agricultural Sciences, Box 7026, 75007 Uppsala, Sweden.

SO Mycorrhiza, (1991) Vol. 1, No. 1, pp. 13-20. 25 ref.

DT Journal
LA English

L9 ANSWER 51 OF 64 CABA COPYRIGHT 2003 CABI
AB Foliage blight is mainly caused by basidiospores and hyphae of *T. cucumeris* AG-2-2 (root rot type), while the AG-1 (web type) isolates cause slight attacks with hyphae alone. Fruit-bodies are the source of primary infection and are formed on the petioles of sugarbeets with root rot or on the soil around them. Hyphae growing from lesions during hot wet weather cause secondary infections. Lesions are enlarged by repeated **hyphal** infection, resulting in typically blighted leaves. Foliage blight incidence may be reduced by suppressing basidiospore formation with sprays of tolclofos-methyl on the crown followed by suppression of disease spread by applications of mepronil or tolclofos-methyl to the leaves.

AN 91:85357 CABA

DN 912308612

TI Ecological role of basidiospores of *Thanatephorus cucumeris* (Frank) Donk in the incidence of foliage blight of sugar beets in Japan

AU Naito, S.

CS Department of Upland Farming Technology, Hokkaido National Agricultural Experiment Station, Hitsujigaoka, Sapporo 004, Japan.

SO JARQ, Japan Agricultural Research Quarterly, (1990) Vol. 23, No. 4, pp. 268-275. 17 ref.

ISSN: 0021-3551

DT Journal

LA English

L9 ANSWER 52 OF 64 LIFESCI COPYRIGHT 2003 CSA

AB In *Saccharomyces cerevisiae* intracellular cAMP mediates environmental signals that regulate cellular metabolism and growth. The studies on the cAMP-requiring mutants and their suppressors in the yeast revealed that cAMP-dependent protein phosphorylation is involved in the G1 phase of the cell cycle, stimulation of the phosphoinositide pathway and the post-meiotic stage of sporulation, and that inhibition of cAMP-dependent protein phosphorylation is required to go into the G0 stage and to induce meiotic division. Growth of some filamentous fungi was observed with significantly reduced levels of cAMP, suggesting cAMP may not be essential for growth in some species of fungi. Germination of fungal spores, yeast-mycelium dimorphism and **hyphal** morphogenesis of several species of fungi were affected by cAMP. cAMP was involved in extension of hyphae, formation of **hyphal** aggregates and fruit body formation. Phosphorylation of cellular proteins is required in these processes, and the nature of these proteins phosphorylated by cAMP-dependent protein kinase is important to the understanding of the role of cAMP for growth and differentiation in fungal cells.

AN 89:115146 LIFESCI

TI Control of growth and differentiation by cyclic AMP in fungi.

AU Ishikawa, T.

CS Sch. Sci. and Eng., Teikyo Univ., Nagaoka-cho, Utsunomiya 320, Japan

SO BOT. MAG. (TOKYO) ., (1989) vol. 102, no. 1067, pp. 471-490.

DT Journal

FS K

LA English

SL English

L9 ANSWER 53 OF 64 CABA COPYRIGHT 2003 CABI

AB Identification of **fruit bodies** of wood decay fungi (mainly corticioid and polypore fungi) uses both macroscopic and microscopic characters, and the type of associated wood rot. Examination of the **hyphal** system of the fruit body is particularly important. Identification of fungal cultures derived from decayed wood, in the absence of **fruit bodies** of the

fungus, is hindered by a lack of literature for Australasian species. Use of the Buller phenomenon (a compatibility test undertaken between the unknown isolate and a known strain) may assist cultural identification. Herbaria and culture collections of wood decay fungi are key resources for identification, and those relevant to the region are listed.

AN 91:102528 CABA
DN 910652986
TI Identification of Australasian species of wood-decay fungi - a New Zealand perspective
AU Buchanan, P. K.; Griffith, J.A. [EDITOR]
CS DSIR Plant Protection, Auckland, New Zealand.
SO New Zealand Journal of Forestry Science, (1989) Vol. 19, No. 2-3, pp. 294-305. 75 ref.
Meeting Info.: Special issue: Workshop on forest health in the South Pacific, Rotorua, 30-31 May and 1 June 1989. Proceedings.
ISSN: 0048-0134
DT Conference Article; Journal
LA English

L9 ANSWER 54 OF 64 CABA COPYRIGHT 2003 CABI
AB Mitochondrial (mt) DNA restriction fragment length polymorphisms (RFLPs) were used as genetic markers for following mitochondrial inheritance in *A. bitorquis*. Although nuclear migration is rare in *A. bitorquis*, unidirectional nuclear migration occurred when a nuclear donating strain (8-1) was paired with a nuclear recipient strain (34-2). The dikaryon recovered over the nuclear recipient mate (Dik D) contained nuclei from both parents but only mitochondria from the recipient mate. Thus, nuclei of 8-1, but not mitochondria, migrated through the resident hyphae of 34-2 following **hyphal anastomosis**. The 2 mitochondrial types present in a dikaryon recovered at the junction of the 2 cultures (Dik A) segregated during vegetative growth. Dikaryotic cells having the 34-2 mitochondrial type grew faster than cells with the 8-1 mitochondrial type. **Fruit bodies**, derived from a mixed population of cells having the same nuclear components but different cytoplasms, were chimaeric for mitochondrial type. The transmission of mitochondria was biased in favour of the 8-1 type in the spore progeny of the chimaeric fruit body. Protoplasts of dikaryon (Dik D), which contained both nuclear types but only the 34-2 mitochondrial type, were regenerated and homokaryons containing the 8-1 nuclear type and the 34-2 mitochondrial type were recovered.

AN 89:120997 CABA
DN 891609120
TI Nuclear migration and mitochondrial inheritance in the mushroom *Agaricus bitorquis*
AU Hintz, W. E. A.; Anderson, J. B.; Horgen, P. A.
CS Mushroom Research Group, Center for Plant Biotechnology, Department of Botany, University of Toronto, Erindale Campus, Mississauga, Ontario, L5L 1C6, Canada.
SO Genetics, (1988) Vol. 119, No. 1, pp. 35-41. 19 ref.
ISSN: 0016-6731
DT Journal
LA English

L9 ANSWER 55 OF 64 CABA COPYRIGHT 2003 CABI
AB A protocol is described for obtaining protoplasts of the edible mushroom *L. [Lentinula] edodes* using an enzyme mix (pH 4.6) of chitinase and the commercial Cellulase Onozuka RS. Using **hyphal** segments from young mycelia, over 6×10^7 protoplasts/ml were obtained in 4 h and a regeneration frequency of >15% was achieved. Dikaryons were formed by confronting cultures between compatible monokaryons which had been regenerated from the protoplasts. The dikaryons produced **fruit bodies** in a sawdust medium in 50-60 days (40 days in strain Meiji 1303-wase). Mating types were retained by protoplasts following isolation and also in polyethylene glycol-induced fusion experiments.

AN 89:17419 CABA
DN 891603078
TI High yield preparation of *Lentinus edodes* ("shiiitake") protoplasts with regeneration capacity and mating type stability
AU Kawasumi, T.; Kiuchi, N.; Futatsugi, Y.; Ohba, K.; Oba, K.; Yanagi, S. O.; Oba, K.
CS Nat. Food Res. Inst., Yatabe, Tsukuba, Ibaraki 305, Japan.
SO Agricultural and Biological Chemistry, (1987) Vol. 51, No. 6, pp. 1649-1656. 18 ref.
DT Journal
LA English

L9 ANSWER 56 OF 64 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.
AB Eight form-species of *Nematoctonus*, including 5 new species, were found in Ontario, and one extralimital species is described as new. Twelve of the 16 species recognised in *Nematoctonus* are described. In several cases, a single form-species includes the anamorphs of more than one teleomorph species. Eight species of *Nematoctonus* are not known to have teleomorphs. Twelve new teleomorph-anamorph connections are made. All teleomorphs occur in *Hohenbuehelia* (tribe *Resupinateae*), and all species of *Hohenbuehelia* treated have *Nematoctonus* anamorphs. The other genera of the *Resupinateae* were not nematophagous. Species of *Resupinatus* and *Stigmatolemma* lack *Nematoctonus* anamorphs, but have **hyphal** structures that suggest that they are parasitic. *Asterotus* and *Stromatocypella* are unknown in culture. Twelve species of *Hohenbuehelia*, four of *Resupinatus*, and one in each of *Asterotus*, *Stigmatolemma* and *Stromatocypella* occur, or are likely to occur, in Ontario. *Hohenbuehelia* is characterised by possession of hymenial metuloids and a *Nematoctonus* anamorph. In addition, fruit bodies of *Hohenbuehelia* have distinctive cystidia in the hymenium or on the surface of the pileus or stipe, which terminate in one or more hourglass-shaped cells, each surrounded by a mucoid droplet. These gloeosphaex cystidia are unique among the agaric genera and resemble the capture organs of *Nematoctonus*. Species of *Resupinatus* lack metuloids, gloeosphaex cystidia and *Nematoctonus* anamorphs, but possess diverticulate cheilocystidia and diverticulate cuticular hyphae, which are not found in *Hohenbuehelia*. The tribe *Resupinateae* should be classified in the *Polyporaceae* (= *Pleurotaceae*) to reflect the affinity of the *Resupinateae* with the genus *Pleurotus*. Parallel study of anamorphs and teleomorphs clarified the taxonomy of the *Resupinateae* at the generic and species levels. New species are: *Nematoctonus angustatus* Thorn & Barron, *N. brevisporus* Thorn & Barron, *N. cylindrosporus* Thorn & Barron, *N. geogenius* Thorn & Barron, *N. hamatus* Thorn & Barron, and *N. subreniformis* Thorn & Barron. New combinations are: *Hohenbuehelia atrocaerulea* (Fr.) Sing. var. *grisea* [*Pleurotus atrocaeruleus* var. *griseus* Peck, 1891] and *H. tremula* [*Agaricus tremulus* Schaeffer in Fries, 1821] Thorn & Barron.

AN 1986:256026 BIOSIS
DN BA82:10775
TI NEMATOCTONUS AND THE TRIBE RESUPINATEAE IN ONTARIO CANADA.
AU THORN R G; BARRON G L
CS DEP. BOT., UNIV. TORONTO, TORONTO, ONT. M5S 1A1.
SO MYCOTAXON, (1986) 25 (2), 321-454.
CODEN: MYXNAE.
FS BA; OLD
LA English

L9 ANSWER 57 OF 64 CABA COPYRIGHT 2003 CABI
AB Micro- and macroscopic features of fruit bodies and mycelia were used to classify 37 spp. of 6 genera. Fruit bodies were analysed using 16 characters, some traditional, others more recent (appearance of the hymenium, orientation of hyphae). The natural division would seem to be into several small, well-individualized groups of dimitic spp. and a residual group of mono- and dimitic spp. Hyphal characteristics, on which the present generic grouping is

based, are considered unsuitable for classifying these fungi. The results allow firm conclusions only at the level of infrageneric regroupings (especially within *Phellinus*), which are also supported by other data.

AN 83:70365 CABA
DN 831390782
TI Taximetric approach to the polyporous Hymenochaetaceae of Europe (fungi, Aphyllophorales)
Approche taximetrique des hymenochetacees porees d'Europe (champignons, Aphyllophorales)
AU Fiasson, J.-L.; David, A.
CS Univ. Lyon, Villeurbanne, France.
SO Canadian Journal of Botany, (1983) Vol. 61, No. 2, pp. 442-451. 3 fig., 2 tab. 30 ref.
ISSN: 0008-4026
DT Journal
LA French
SL English

L9 ANSWER 58 OF 64 USPATFULL

AB The invention relates to a process for producing monokaryons of dikaryotic strains of Basidiomycetes by chemical means, for instance *Pleurotus ostreatus*, *Kuehneromyces mutabilis*, *Flammulina velutipes* or *Lentinus edodes* under gentle conditions so that essentially two monokaryons result per dikaryon-containing **hyphal compartment**. These monokaryons can be used for mating with compatible partners to give dikaryotic Basidiomycetes strains.

AN 81:141 USPATFULL
TI Process for preparing monokaryons by dedikaryotizing dikaryotic strains of Basidiomycetes
IN Eger, Gerlind, Leckergasschen 2, 3550 Marburg an der Lahn, Germany,
Federal Republic of
Leal Lara, Hermilo, Richtsberg 88-602, Marburg an der Lahn, Germany,
Federal Republic of
PI US 4242832 19810106
AI US 1979-23772 19790326 (6)
PRAI DE 1978-2813521 19780329
DT Utility
FS Granted
EXNAM Primary Examiner: Bagwill, Robert E.
LREP Kenyon & Kenyon
CLMN Number of Claims: 15
ECL Exemplary Claim: 1
DRWN No Drawings
LN.CNT 789

L9 ANSWER 59 OF 64 CABA COPYRIGHT 2003 CABI

AB A checklist of the 260 spp. of rot fungi on *Populus tremuloides* and *P. grandidentata* is followed by keys to families and subfamilies of the Aphyllophorales and to genera of Agaricales, and descriptions of the fruit-bodies, hyphal system, cystidia, basidia, basidiospores and types of rot for each species.

AN 80:36541 CABA
DN 790658462
TI Basidiomycetes that decay aspen in North America
AU Lindsey, J. P.; Gilbertson, R. L.
SO Basidiomycetes that decay aspen in North America, (1978) pp. 406. 12 pl. 115 ref.
Publisher: J. Cramer. Vaduz
Price: DM 120.
ISBN: 3-7682-1193-2
Secondary Source: Review of Plant Pathology 58, 4521
CY Liechtenstein
DT Miscellaneous

- LA English
- L9 ANSWER 60 OF 64 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.DUPLICATE
12
- AB *T. fulvocastaneum* is distributed in the deciduous forests of *Quercus* and in the evergreen forests of *C. cuspidata* and other *Castanopsis* spp. in the southwestern district of Japan. The fruit bodies of this fungus form a fairy ring. The mycelial layer grows in mineral soil horizons with little organic matter. The morphological features of the shiro in *Castanopsis* forest resemble those of *T. matsutake* and are the same as those of *T. fulvocastaneum* in *Quercus* forest. In the forest, the shiros are distributed mainly on the slope or flat of red soil with compact soil structure and relatively high humidity. The mycorrhiza formed on the root of *C. cuspidata* are of the witch's broom type, black and with elongated and branched fine roots. Apparently it has parasitic characters because of the heavy hyphal invasion and the lack of fungal sheath. Some filamentous fungi are excluded from the inside of shiro, but the antifungal activity is not as strong as that of *T. matsutake*. The recovery of soil fungal flora inside the shiro progresses more rapidly than in the case of *T. matsutake*.
- AN 1979:218669 BIOSIS
- DN BA68:21173
- TI MICROBIAL ECOLOGY OF SHIRO IN TRICHOLOMA-MATSUTAKE AND ITS ALLIED SPECIES PART 7 TRICHOLOMA-FULVOCASTANEUM IN CASTANOPSIS-CUSPIDATA FOREST.
- AU OGAWA M
- CS FOR. FOR. PROD. RES. INST., P.O. BOX 2, USHIKU, IBARAKI 300-12, JPN.
- SO TRANS MYCOL SOC JPN, (1978) 19 (1), 37-46.
- CODEN: NGKKAT. ISSN: 0029-0289.
- FS BA; OLD
- LA Japanese
- L9 ANSWER 61 OF 64 CABO COPYRIGHT 2003 CABI
- AB Hyphal cells expanded by 2 or 3 times during the development of the fruiting body. Vacuoles in the cells expanded extensively. Electron microscopy showed the fruiting body to be composed of woven aggregated hyphal cells. The mushrooms contained 88-90% water. Analysis of the remaining 10-12% gave 18-20% protein, 20.2-22.0% carbohydrate, 9.5-11% fibre, 55-60% water soluble substances and 8.1-9.0% ash. The chief carbohydrate was mannitol but trehalose and fructose were also found. The button stage contained more flavour components than the later stages.
- AN 78:11107 CABO
- DN 780360966
- TI Ultrastructural and biochemical changes during the development of *Agaricus bisporus* fruit-bodies
- AU Lin, L. P.; Teng, Y. P.; Fong, J. C.
- CS National Taiwan University, Taipei, Taiwan.
- SO Memoirs of the College of Agriculture National Taiwan University, (1975) Vol. 16, No. 1, pp. 65-74. 9 pl. 21 ref.
Meeting Info.: Lin, L. P.; Hsieh, S. I.; Teng, Y. P.; Fong, J. C. : Ultrastructural characterization of mycelia and fruit-bodies of the cultivated mushroom, *Agaricus bisporus* in Taiwan.
- DT Journal
- LA Chinese
- SL English
- L9 ANSWER 62 OF 64 CABO COPYRIGHT 2003 CABI
- AB Three sizes of polyhedral virus like particles were found in partially purified preparations from fruit bodies and mycelia of *L. edodes*. They were c. 25, 30 and 39 nm diam., measured in negatively stained preparations. Only one property typical of a nucleoprotein from the 39 nm particles was demonstrated. In thin sections of stipes and gills polyhedral virus like particles c. 37 nm (equivalent to 39 nm in negatively stained preparations) were observed. They were usually confined to the ground cytoplasm of hymenial and stipe cells. Similar particles

L11 ANSWER 62 OF 93 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.

AB The fruit body formation of *Schizophyllum commune* was greatly stimulated by the addition of papulacandin B, aculeacin A, gramicidin S, luteinizing hormone-releasing hormone (LH-RH), or digitonin to the culture media. Papulacandin B and aculeacin A inhibit glucan synthase, which was demonstrated with *S. commune* in vitro in this study. The in vitro *S. commune* glucan synthase was activated by phospholipids that counteracted the stimulation of fruit body formation by papulacandin B. LH-RH, however, did not inhibit the glucan synthase. Digitonin was known to inhibit chitin synthase, but polyoxin B, a substrate analogue inhibitor of chitin synthase, did not stimulate the fruit body formation. The characteristic common to most of these stimulators of fruit body formation is possible induction of structural changes of plasma membranes to which the substances can attach with their biphasic nature. These stimulators of fruit body formation were mostly accompanied by an evident suppression of hyphal growth, independent of phenoloxidase activity, and not observed in continuous dark or with monokaryotic strains.

AN 1993:590946 BIOSIS

DN PREV199497010316

TI Stimulation of *Schizophyllum commune* fruit body formation by inhibitor of membrane function and cell wall synthesis.

AU Oita, Shigeru; Yanagi, Sonoe O.

CS Natl. Food Res. Inst., Ministry Agric. Forestry Fisheries, 2-1-2 Kannondai, Tsukuba, Ibaraki 305 Japan

SO Bioscience Biotechnology and Biochemistry, (1993) Vol. 57, No. 8, pp. 1270-1274.

ISSN: 0916-8451.

DT Article

LA English

L11 ANSWER 52 OF 93 CABA COPYRIGHT 2003 CABI

AB Ascocarps of *M. vulgaris*, *M. rotunda* and *M. elata* were collected from different geographical areas of Greece. Field observations on subterranean hyphal systems at different stages of fruit body development indicated the existence of a close association between morel ascocarps and higher plant roots. An electron microscopy study of mycelial-soil aggregates revealed the existence of a differentiation progression in mycelial network, strand and sclerotial morphogenesis. Ascocarp and subterranean tissue isolations were subsequently compared in vitro with ATCC strains of *M. esculenta*, *M. angusticeps* and *M. crassipes*. The effect of successive culture on a rich and then poor nutritional base on sclerotial morphogenesis was examined using the "split-plate méthode" and a "tube method" simulating soil conditions. Distinct differences in sclerotia number, size and arrangement were observed among all *Morchella* strains. In particular, *M. esculenta* formed sclerotia on the nutrient-rich side of the split plates and only when mycelium originated from the nutrient-poor half of the dish. Two types of sclerotia were formed into the soil layer and the organic medium composing the substrates of the "tube method". Their possible relation with sclerotial morphogenesis in nature is discussed.

AN 96:17204 CABA

DN 960301034

TI Studies on the morphogenesis of sclerotia and subterranean mycelial network of ascocarps in *Morchella* species

AU Philippoussis, A.; Balis, C.; Elliott, T. J. [EDITOR]

CS Laboratory of General and Agricultural Microbiology, Agricultural University of Athens, Greece.

SO Mushroom science XIV, Volume 2. Proceedings of the 14th international congress on the science and cultivation of edible fungi, Oxford, UK, 17-22 Sep. 1995, (1995) pp. 847-855. 4 pl. 25 ref.
Publisher: A. A. Balkema. Rotterdam
Meeting Info.: Mushroom science XIV, Volume 2. Proceedings of the 14th international congress on the science and cultivation of edible fungi, Oxford, UK, 17-22 Sep. 1995.
ISBN: 90-5410-572-0

CY Netherlands Antilles

DT Conference Article

AB The life cycle of *Tricholoma robustum* and the related species was examined from the viewpoint of nuclear behavior and regulating mechanism in the various developmental stages. Among seven Matsutake related species, *T. matsutake*, *T. caligatum*, *T. ponderosum*, *T. bakamatsutake*, *T. fulvocastaneum*, *T. robustum*, and *T. zelleri*, nuclear distribution in **hyphal cells of isolates from fruit-body tissues** and single basidiospores was examined by double staining of nuclei and septa. None of these species have clamp connections in the hyphae of isolates from **fruit-body tissues**, but they were all proved to be dikaryons. All of the hyphae of isolates from single basidiospores examined were monokaryons. These results suggest that the mating system of these species seems to be heterothallic. In basidiospore germination of *T. robustum*, two patterns of nuclear behavior were observed. One is that the first nuclear division occurred within basidiospores, and one of the daughter nuclei migrated into germ tube. The other is that the nucleus migrated into germ tube followed by the first nuclear division. The germ tube consisted of mononucleate cells from the initial stage of germination. In *T. robustum*, culture medium was acidified during mycelial growth, and the responsible substance was identified to be gluconic acid by HPLC and enzymatic analysis. *T. bakamatsutake* was the second highest producer of gluconic acid among 7 related species. Activity of glucose oxidase, which is responsible enzyme for gluconic acid production, was also highest in *T. robustum*. Basidiospore germination in *T. robustum* was induced by coinoculation of conspecific mycelia, and one of the active substances produced by mycelia was gluconic acid.

AN 1994:494862 BIOSIS

DN PREV199497507862

TI Studies on the life cycle of the ectomycorrhizal fungus *Tricholoma robustum*.

AU Iwase, Koji

CS Biological Environment Inst., Kansai Environmental Engineering Cent. Co. Ltd., 8-4 Ujimatafuri, Uji 611 Japan

SO Nippon Kingakukai Kaiho, (1994) Vol. 35, No. 2, pp. 130-133.
ISSN: 0029-0289.

DT Article

LA Japanese

SL English